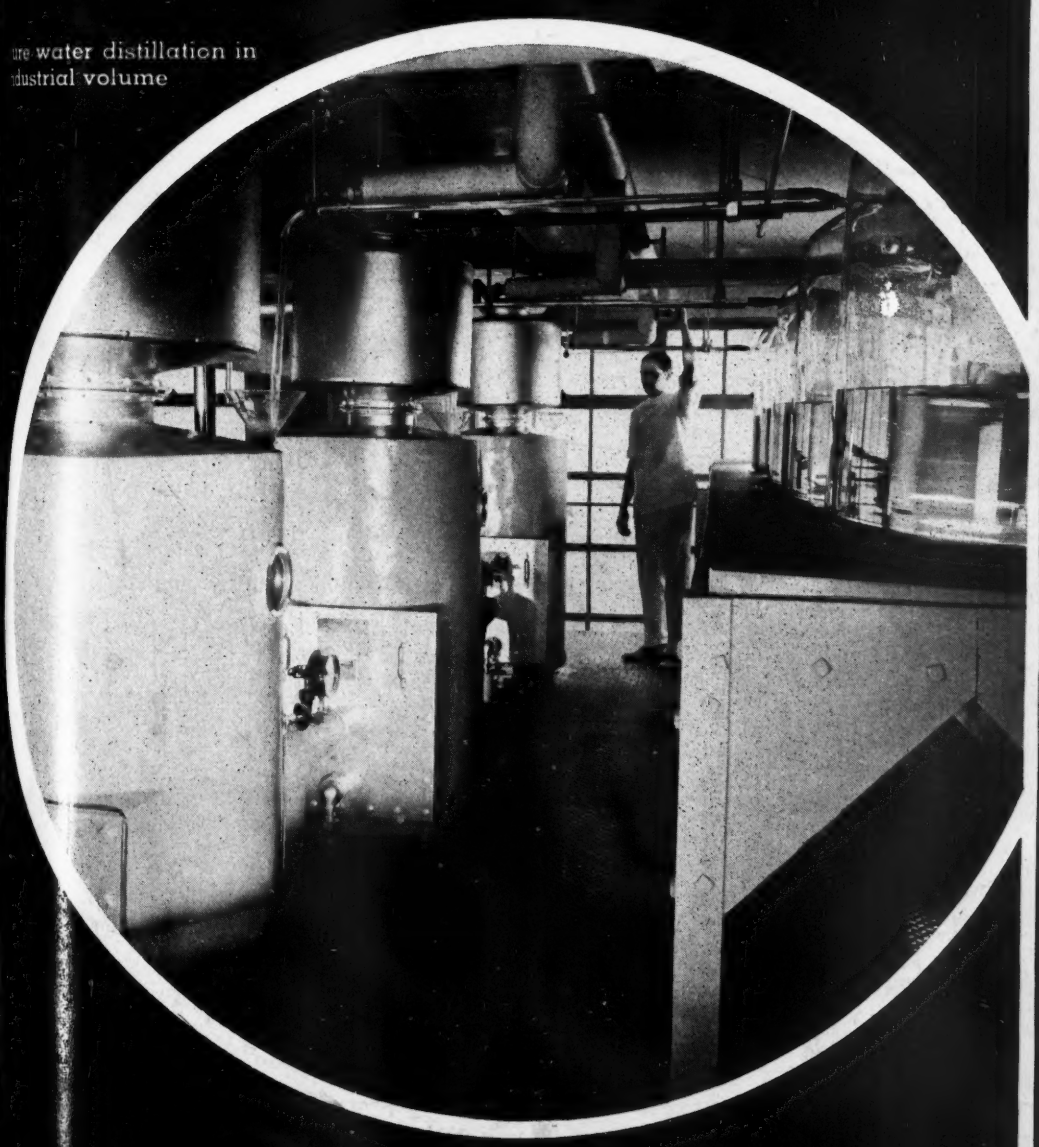
EAST ENGINEERING
LIBRARY

FOOD INDUSTRIES

FEB 1 5 1946

● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION



ure water distillation in
dustrial volume

FEBRUARY 1946

So You Want To Be A Foreman?

Preview of Chemica Industries Show

Planning For Clean Flavor

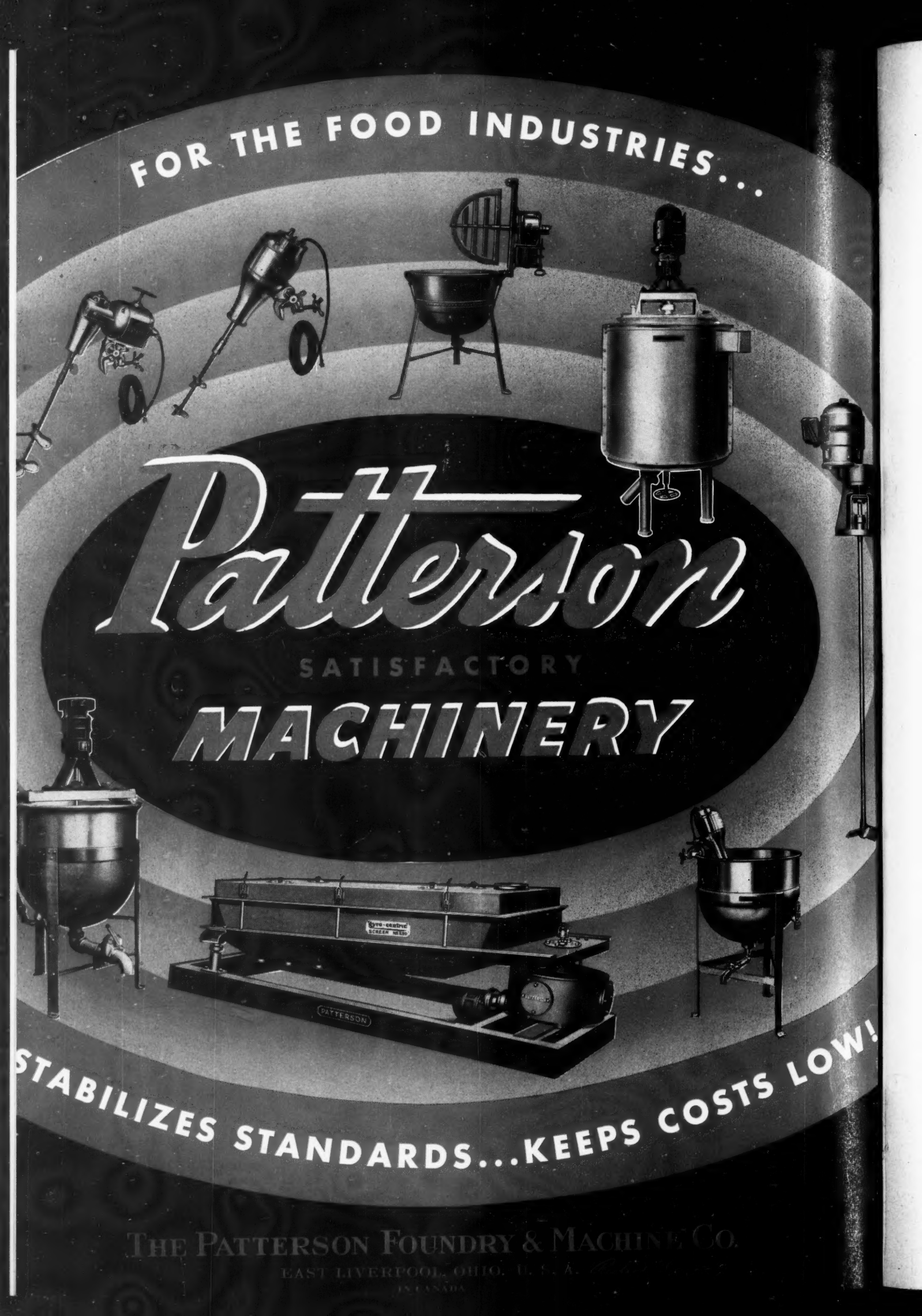
How Cold Damages Canned Foods

Aqua Destillata—Methods and Costs

Keep An Eye On Law Suits

Sweet Potato Gels —Something New

McGRAW-HILL PUBLICATI


FOR THE FOOD INDUSTRIES...
Patterson
SATISFACTORY
MACHINERY
STABILIZES STANDARDS...KEEPS COSTS LOW!
THE PATTERSON FOUNDRY & MACHINE CO.
EAST LIVERPOOL, OHIO, U. S. A.

M. A. Williamson.....Publisher
L. Charles Mazzola.....Associate Editor
Hilda G. Howe .....Art Editor
J. A. J. Jones.....Assistant Editor
Donald D. Hogate.....Washington, D. C.
S. T. Henry.....Spruce Pine, N. C.

FOOD INDUSTRIES

Laurence V. Burton .....Editor
E. S. Stateler....Associate Editor, Chicago
C. R. Havighorst
Associate Editor, San Francisco
R. S. McBride.....Washington, D. C.
Malcolm Burton.....Washington, D. C.
Earle Mauldin.....Atlanta, Ga.

VOLUME 18, NUMBER 2

FEBRUARY, 1946

TECHNOLOGY

VITAMINS
Storage Temperatures 191

FATS AND OILS
Rancidity Determinations 191

MEATS
Antioxidants Retard Rancidity of Bacon..191

DAIRY
Dry Milk for Ice Cream.....191
Volumetric Moisture in Dairy Products...191

ENGINEERING
Ferric Sulphate for Sewage Disposal.....192
It's Time to Standardize Materials Handling Equipment 88

DEHYDRATION
Troublesome Reactions in Dried Eggs....194
Sweet Potato Gels—Something New.....106

SANITATION
Inhibitors of Sulphate Reducing Bacteria..200

STORAGE
Insect Control 200
Damage by Freezing to Canned Meat Products Containing Carbohydrates....102

MATERIALS
Tinplate Protection 202

MISCELLANEOUS
Cocoa Extraction 202
Gelatin Extraction 204

QUALITY CONTROL
Control of Microbiological Food Spoilage by Fumigation with Epoxides—Part II... 84
Planning For Clean Flavor..... 98
Aqua Destillata, Its Cost and Convenience 90

FREEZING
Quality Control of Precooked Frozen Foods 94

THE COVER

Battery of three Barnstead continuous-type water stills, that will produce 2500 gallons of water per 12-hour day. The distillate is of a very high purity, being practically free from traces of metallic or organic impurities. This process may prove valuable where the available ingredient water is hard and the finished product is adversely affected by it.

DISTRICT MANAGERS

NEW YORK 18.....A. G. Sutherland
330 W. 42nd St. MEdallion 3-0700
BOSTON 16.....W. Donald Boyd
1427 Statler Bldg. Hubbard 4911
ATLANTA 3.....Ralph Maultsby
1011 Rhodes Haverty Bldg. Walnut 5778
CLEVELAND 15.....Thomas E. Taylor
1510 Hanna Bldg. Main 3081
DETROIT 26.....H. P. Ruprecht
2880 Penobscot Bldg. Randolph 1793
CHICAGO 11.....A. E. Del Gado
520 N. Michigan Ave. Whitehall 7900
PHILADELPHIA 2.....Edward A. Martin
16 S. Broad St. Rittenhouse 0670
ST. LOUIS 8.....G. G. Sears
3615 Olive St. Newstead 7600
SAN FRANCISCO 4.....J. W. Otterson
68 Post St. Douglas 4600
LOS ANGELES 14.....Roy Phelan
621 S. Hope St. Michigan 3873
SALES MANAGER, Ivan C. Miller

SPECIAL FEATURES

Labor Forgets the Investor.....*By L. V. Burton* 71
Preview of Exhibit 20th Chemical Show
By L. Charles Mazzola 76
Keep An Eye on Law Suits.....*By Leo T. Parker* 108

MANAGEMENT

So You Want To Be a Foreman?.....*By W. R. Van Meter* 73

QUALITY CONTROL

Control of Microbiological Food Spoilage by Fumigation with Epoxides—Part II.....*By Rita Whelton, H. J. Phaff, E. M. Mrak and C. D Fisher* 84
Does Instinctive Appetite Correct Science?..*By Bert D. Ingels* 87
Planning For Clean Flavor.....*By J. A. Dunn* 98
"Orange Juice"—Words, Orange Juice—The Thing
By Bernard C. Baum 101

ENGINEERING

It's Time to Standardize Materials Handling Equipment
By Nathaniel Warshaw 88

PRODUCTION

Aqua Destillata, Its Cost and Convenience..*By Haldane Gee* 90

FROZEN FOODS

Frozen Foods Skyrocketed in Wartime Germany..... 93
Quality Control of Precooked Frozen Foods
By Barbara L. Hutchings and Clifford F. Evers 94

DISTRIBUTION

Damage by Freezing to Canned Meat Products Containing Carbohydrates .....*By Bertram W. Gardner, Jr.* 102
Tank Trucks Haul Yeast and Malt..... 111

MATERIALS

Sweet Potato Gels—Something New
By G. L. Baker and C. W. Woodmansee 106

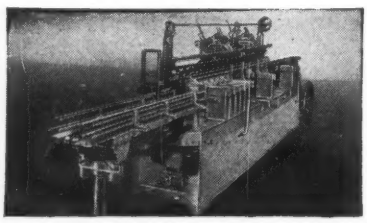
EVERY MONTH

Editorials.....71 and 113
The Talk of the Industry..... 72
Automotive 111
New Packages and Products.....116
Food Industry News.....123
Indicators 156
What Washington Thinks.....158
Men, Jobs and Companies.....161
New Equipment News.....169
Catalogs and Bulletins.....187
Food Technology—Abstracts.....191
Books 207
Patents 211
Letters To the Editor.....213

McGRAW-HILL PUBLISHING CO., INC., James H. McGraw, Founder and Honorary Chairman. PUBLICATION OFFICE: 210 S. Desplaines St., Chicago 6, Ill. Return postage guaranteed. EDITORIAL AND EXECUTIVE OFFICES: 330 West 42nd St., New York 18, N. Y. (Address correspondence here.) BRANCH OFFICES: 520 North Michigan Ave., Chicago 11; 68 Post St., San Francisco 4; 739-9 Oliver Bldg., Pittsburgh 22; Aldwych House, Aldwych, London, W. C. 2; Washington 4; Philadelphia 2; Cleveland 15; Detroit 2; Los Angeles 14; St. Louis 1; Boston 16; Atlanta 3. JAMES H. McGRAW, JR., President; CURTIS W. McGRAW, Senior Vice-President and Treasurer; HOWARD EHRLICH, Vice-President and General Business Manager; EUGENE DUFFIELD, Editorial Assistant to the President; JOSEPH A. GERARDI, Secretary, and J. E. BLACKBURN, Jr., Director of Circulation. CABLE ADDRESS: "McGRAW-HILL, N. Y." Member A. B. P. Member A. B. C. Contents indexed monthly in Industrial Arts Index. Copyright 1946, by McGraw-Hill Publishing Co., Inc.—All rights reserved.

YOUR GOOD LABEL

deserves the best application the WORLD can give

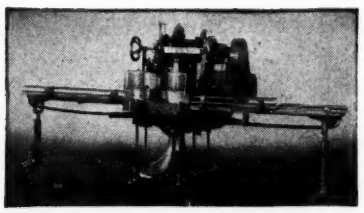


The WORLD BEE-LINE Labeler applies front labels, front and back labels and often neck labels too, if desired, to containers of a wide variety of sizes and shapes.

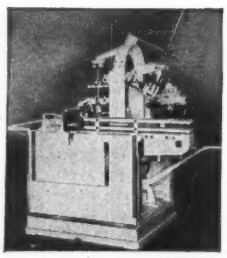
You don't have to fit your production, your containers, your labels to the Labeler. There is a WORLD Labeler to fit the job — in the one best and most economical way.

That is why it will pay you to keep in touch with the WORLD. No matter how simple or how specialized your requirements you can depend on it that the WORLD Labeler recommended for the job will be the *right* Labeler for the job — because only WORLD builds all sizes and types.

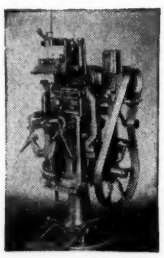
Why not tell us about your labeling problem or, better yet, send us samples of your labeled containers and let us submit detailed recommendations and estimates.



The WORLD ROTARY Labeler applies body labels, neck labels, and foil if desired, to all kinds of round bottles and jars.



The WORLD TURRET Labeler does extra fine labeling of smooth, fluted or fancy round containers.



The WORLD Semi-Automatic Labeler applies body labels, neck labels, foil, all-around labels to any size container from ounces to gallons.

WORLD LABELERS

"YOU GET THE BEST LABELERS IN THE WORLD"

ECONOMIC MACHINERY COMPANY

Builders of World Automatic and Semi-Automatic Labelers for Every Purpose

WORCESTER, MASSACHUSETTS

New York Philadelphia Pittsburgh Chicago San Francisco Denver
Louisville Salt Lake City El Paso Seattle Portland Phoenix London
Montreal Toronto Winnipeg Spokane Vancouver Mexico City
Sydney, Australia Wellington, N.Z. San Juan, P.R. Guided Traffic, D.F.

FOOD INDUSTRIES is published monthly. Price 35c per copy. Allow at least ten days for change of address. Publication Office, 210 South Desplaines St., Chicago 6, Ill. Subscription rates: United States and possessions, Mexico, Central and South American countries, $3 a year, $4 for two years, $5 for three years. Canada, $3.50 a year; $5 for two years; $6 for three years (payable in Canadian or U. S. Funds). Please indicate position and company connection on all subscription orders. All other countries, $5 a year, $8 for two years, $10 for three years. Entered as second-class matter September 9, 1944, at the Post Office at Chicago, Ill., under the act of March 3, 1879.

Labor Forgets the Investor

I CANNOT but believe that organized labor is mistaken about the reasons it gives to justify its demands for 30 percent wage increases. The human desire for more money is quite understandable, but the process by which it attempts to rationalize that desire is faulty. It omits at least two fundamental economic factors: the investment in tools and plant and the indirect effect of taxes that business must pay before the owners can derive any share of the profits.

For 50 years industry has gradually provided a higher standard of living for its workers despite a marked reduction in working hours. This gain for workers has been accomplished, however, by raising the output per man, not by raising labor's share of the customer dollar. And output per man has been raised by expanding the *capital investment per worker*. More machines and better machines have made possible the higher standards of living.

But better machines are paid for by the investor—not by management—and certainly not by the workers themselves. Yet the demands for wages and for income taxes leave little profit with which to provide the further investment that can make still higher wages possible. If labor wants 30 percent more money, labor and government must not kill the goose that lays the golden eggs.

Between 1904 and 1937 the output of manufactured foods has almost tripled. Yet, because *output per man* increased one-third, only twice as many wage earners were required to produce the 1937 output. This increase in output per man was made possible by a doubling of capital assets per worker; $3,200 in 1904, up to $6,300 in 1937. Somebody put up the extra money.

Where Do Wages Come From?

The Department of Commerce uses a term called *value added by manufacture*. It covers the money available to pay wages, salaries, taxes, overhead and profits. In the food industry, it has remained at nearly 30 percent for the entire period. It was 30.6 percent in 1904. In 1937 it was 29.9 percent.

During that interval, however, real hourly earnings doubled while average hours dropped from 61 to 42, or 30 percent, for example, in baking, slaughtering and meat packing. Wage earners as a whole didn't do so badly. But stockholders have not fared so well, especially since 1925. Figures, too voluminous to publish here, show the *percent net income after taxes to net worth* of industries in the food field has generally declined. (Sugar is the exception in 1944.)

Especially significant to labor's aspirations for further wage increases is the decline in *net capital per wage earner* since 1931, reported by National Industrial Conference Board, $8,800 in 1931 to $6,300 in 1937 and up slightly to $7,000 in 1941. This decline in investment return has so reduced the incentive to invest that the long term upward trend in *capital invested per worker* has halted. Yet, if labor wants to receive more pay it must be aided by more and better machines.

Now come the wartime squeezes: (1) the higher unit labor costs that outran price increases; (2) the all-time high of income taxes on those who normally provide the investment capital. The first of these squeezes came on *value added by manufacture* ranging from 5 percent in baking to 15 percent in cane sugar refining, with the other food industries lying in between. Food has been luckier than manufacturing as a whole, where the squeeze has been between 15 and 20 percent. Yet, it is from what remains after this squeeze that increased wages must be paid. There is no other source.

If wages actually go up another 30 percent, as demanded, the squeeze becomes greater as long as price controls remain. And, if the income tax collector siphons off the price of the new and better machines, where is labor to look for these mechanical aids to higher wages?

Labor wants more money. It can get it only if the necessary capital per worker is increased. But if income taxes remain what they are and if unwise wage increases leave little profit to the investor, there is no incentive to invest.

So What?

This is no plea for special consideration for the investor, or the worker, or management. It is, however, a plea that each understand that he can't get along without the other. There is plenty to go around in America until any one of these groups tries to grab off too much. When the grab comes, the total amount of available production is reduced and we all have to share less instead of more.

H. V. Burton EDITOR

The Talk of the Industry

• DR. REXFORD GUY TUGWELL, one time connected with the canning firm of Tugwell and Wiseman, where his pa was one of the owners, next on the faculty of Columbia University, more recently Under Secretary of Agriculture, later a vice-president of American Molasses Co., and finally Governor of Puerto Rico, where he has been in the hair of the sugar planters for some years, is to re-enter university work. The University of Chicago has announced that he will be director of its new program of education and research in planning.

It is to be hoped that his costly education at taxpayers' expense has taught him something about human behavior, especially that a higher standard of living can be only achieved by people who work for it. It cannot be bestowed by a benign government upon an unresponsive people.

• EVERY week there appears news about the large numbers of ships ready to sail to Europe with relief coal and food. But sailings are delayed by lack of crews. Sometimes the figure reaches the 70 mark. What the cold and hungry and destitute may think about it would not be exactly complimentary to Americans.

• IN Hungary's cities, food is so scarce that the wretched inhabitants have available only 1410 calories a day. It takes about 1100 to 1200 calories to stay alive. Meat is so scarce that even breeding stock are going to slaughter.

• IN grim contrast to the situation in Hungary is the United States egg situation where it is necessary for the Government to support the price by buying eggs that it does not know what to do with.

• "How much insurance for $150,000 worth of alcohol," asks the Atlantic Mutual Insurance Company, and then supplies the answer: $2,650,000! Anyone who has to do with the purchase of undenatured ethyl alcohol knows how little is its actual cost and yet how huge is the tax load it must carry.

• EMPLOYERS are having a new peacetime experience these days. It is not enough to offer a job to a desirable candidate. The only result-producing technic seems to be to "sell" him the job.

And how the candidates enjoy being sold!

• AFTER years of drought, Australia now has had enough rain to nearly triple its last year's wheat crop.

• THE Atlantic Fishermen's Union, working out of Boston, have struck for a bigger share in the catch. Previously they received half the value of the fish landed at the Boston Fish Pier but now they demand 60 per cent. The trawler owners refuse to operate on only 40 per cent. In times like these, crew members can make as much as $100 a week on a 50-50 split.

Several years ago a big steam trawler was lost with all hands. The owner, calling on the widows of the men who follow this hazardous calling, found that all were practically destitute, despite the fact that in previous months their husbands had been paid several thousand dollars. It's a strange business.

• ADVOCATES of prepackaged fresh foods claim as a selling point that the housewife won't have to clean them. New York department stores have the answer to that. They are offering automatic food washers that claim to take care of the entire messy job.

• FIRMS that advertise how they have paid continually higher wages, reduced selling prices and yet have maintained reasonable profits are doing a good thing. We believe they would do still better if they would also show how much money is invested in plant and equipment to make each job. Some hourly workers have not the faintest notion of what it costs to give a man a job in industry.

Hors d'Oeuvres

• California is the leading commercial rabbit state. Maybe it's because they're so adept at pulling them out of the hat out there.

• *Pecans (with a broad "a") now can be harvested with Kaiser-like efficiency.*

• A Georgian grower has developed a harvester which spreads a canvas sheet under the trees, shakes down the nuts, then winds up the canvas to collect the harvest. Another machine sifts the chaff from the nuts. About time something was done for this industry, which not so many years back was able to pay wages of only a few cents an hour.

• *An article on the subject tells us that the processing of peanuts is a shakedown. Nuts ride to the top of plants, then by gravity roll down to the bottom, meanwhile passing through various machines for shelling, cleaning, etc. It does sound like a quiet evening in a wartime night club.*

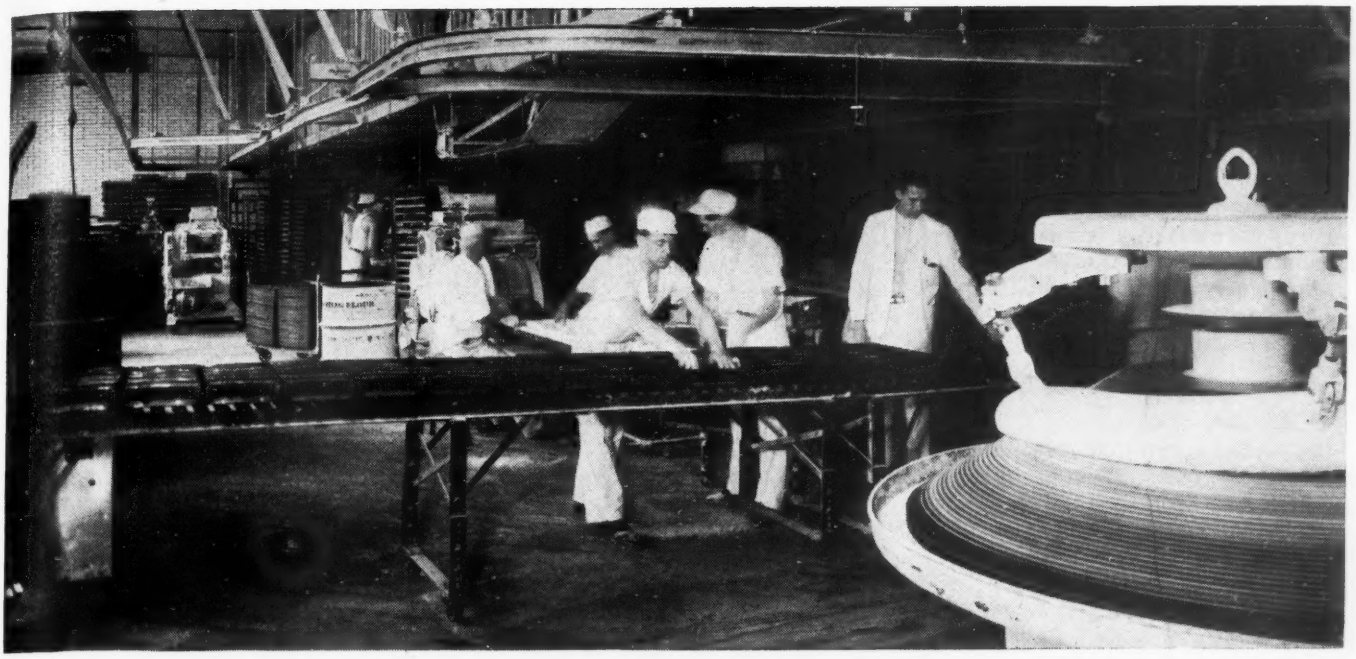
• Hens in Beltsville, Md., are laying eggs especially designed for poaching or frying. They have much more thick-white than ordinary eggs. Now, just a little more effort and we'll be getting them already fried or poached.

• A year ago Anheuser-Busch bought a site in Newark on which to build a new brewery. Last month Pabst took over the Hoffman Brewing Co. in the same city. Ballantine has been there since the beginning. In this round about way Schlitz is building up Newark as a super testing ground for its salesmen.

• *A news item relates that "speakers at the annual convention of Western Beet Growers Association in Great Falls, Mont., told the growers that the industry's ability to produce would decide the public's support of it." We're mighty glad to know that it's that way in beet growing, too.*

• To reduce bruising and injury to potatoes in transit to eastern markets, experts at the University of California, college of agriculture, recommend the use of floor pads in freight cars, disclosing that tests have shown that pads save one to four bags per car. The softies.

• *As a matter of simplification the Edward Valve & Mfg. Co., East Chicago, Ind., has changed its name to Edward Valves, Inc. We'd be glad to go right along with a simplification of the East Chicago, Ind., too. J. A. J. J.*



The foreman has to know the whole shop—jobs, machinery and the men who run them. To study these units, one-by-one, is the only sound formula for a leader in the making.

So You Want To Be A Foreman

How can a young man improve his lot and draw more pay? To all those with a desire to get ahead this article should prove beneficial. The principles laid down here can be applied to any branch of the food industry

By W. R. VAN METER, Kingston, Pennsylvania

AT SOME time in the life of that bakery employee, known as a mixer, he will undoubtedly look at his foreman and ask himself a question. If it is answered honestly and acted upon decisively, it may well be the true $64 question, so far as the mixer is concerned. The question will be simply this: "What does my foreman have that I haven't got?"

Now, let us make it clear that the mixer in a bakery is already a man of some importance, both to the boss and to his fellow employees. His job calls for a fair amount of responsibility and skill.

His responsibility is to see that the raw materials sent to him from the scaling room are properly combined in his machine to form a batter or dough which will be homogenous, of the right density and temperature, and to produce enough of such batter to keep the depositors or dividers and ovens functioning without interruption. At the same time, he must keep a wary eye on the batter in his machine, alert to catch mistakes that may have been made in the scaling room. He must also have a good degree of skill in combining his ingredients, for some of the formulas used will need the greatest attention to prevent "breaking-down" of a batter.

So then, you, the mixer, are asking yourself wherein lies the difference between you and the foreman. Briefly put, the foreman will always have a considerably greater knoweldge of baking and shop operations, and a much greater experience and skill in handling men than you have. Yet for the man who wants to go further in his work, there are always things that he can do to help himself advance. The purpose of this article is to point out what those things are.

Don't Shout About Your Plan

Here at the beginning it might be wise to emphasize that what you are about to do is largely a thing which is important to yourself only. Your intentions are not something to be blared out to everybody within range. Reflect for a moment upon the thought that when a man goes hunting knowledge, just as when he goes after pheasant, rabbit or deer, he goes about it quietly if he seriously expects to get anything. He does not hire a brass band to announce his coming.

The first step you must take along the road that leads to a foreman's job is to expand your own knowledge of the art and science of baking, and also of shop operations. Do you understand the technical reasons for all of the operations in your own job? Or, are you following a certain procedure blindly because that was

the way your foreman taught you the job in the beginning? Can you mix the most difficult formulas made in the shop? Ask yourself these and similar questions, and answer them honestly. You'll quickly find the weak spots in your knowledge.

In addition to knowing your own job perfectly, you must acquire a mental picture of the whole shop as a complete production unit and get a clear idea of the place of every job and operation in it.

How to Start Training Yourself

One very good way to do this, in the writer's opinion, is to start the note-book habit. Get an ordinary school note-book and a couple of pencils from the five and ten cent store. On the first page of the book, draw a diagram of the shop and mark in the position of the main pieces of equipment, such as scaling room, mixers, depositors, ovens, pan washer and pan greaser.

For a week or so, study the jobs of the other men in the shop. After work each day, take ten or fifteen minutes at home to put down what you have learned. For example, what are the duties and responsibilities of oven men? Or depositors? Or scalers? Or pan greasers? What are the difficulties they work under, what are the things they can do which make for efficient operation, and what are the things they sometimes slip into which make for inefficient operation? How do the job of all these men fit into the overall bakery operation?

After a short period of such observation, making notes as you go along, you are going to have a far better idea of your own, and the others, place in the scheme of things. A man tied to his own machine, competent in the operation of it, is very likely to take the short-sighted view that the operation of the whole plant largely revolves around his job and his machine. A man like yourself, who is aiming at a foreman's job, must take a broader view than merely perfection on a single operation.

Next, you should begin to make notes about the machinery used in the shop. Your objective is to know the mechanical details of all the machines sufficiently well to be able to make temporary emergency repairs in the absence of a trained mechanic. This should also make you understand enough concerning machinery to know when a machine is being mishandled and also to detect when it is giving the first faint signs of a coming breakdown.

How to Learn About Machines

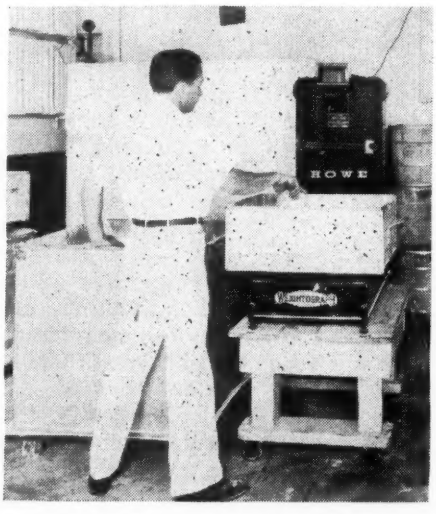
How can you get this sort of information and experience? Much of it you can get from your foreman—in fact, you will usually find your foreman very willing to help you on all these matters if properly approached. You will certainly find the shop mechanics eager to help. It is a very rare mechanic who lacks so much pride in his work, and interest in seeing that others appreciate and handle carefully the machines they work with, that he will not gladly "beat his gums" on this subject.

You must also increase your knowledge of the raw materials used in baking. What are the conditions under which sugar, flour, glucose, frozen eggs, cocoa, chocolate, and so forth, must be handled and stored for best results? What is the proper way to defrost frozen eggs? What can happen to shredded coconut if it is improperly stored for any length of time?

Learn How to Calculate

You should learn enough about the composition of the more commonly used raw materials to be able to make adjustments in formulas when it is necessary to substitute one raw material for another. This may happen when powdered milk takes the place of liquid skim milk in a formula, or when in making a "stock" using sugar and liquid skim milk it becomes desirable to substitute sweetened condensed milk. In such cases, you should be able to figure out the adjustments that have to be made.

It is quite true, of course, that formula changes should properly come from the production office, in which case the foreman is not called upon to make substitutions. However, such a system of handling formulas is by no means universal, and in any event the knowledge should be part of the foreman's mental equipment, if only for emergency use.



A knowledge of the raw materials used in the plant's operations is part of the foreman's equipment. Weighing out ingredients is only one of the phases in that requirement.

You will find that your knowledge of raw materials may be increased in many ways. You will also find that, as you increase one section of your information, it has an enlarging effect on everything else.

Where to Find More Knowledge

In respect to this business of acquiring information, a great many of the men in industry who want it are actually not aware of the vast amount of factual material which is at their disposal. They limit themselves to acquiring information by word-of-mouth channels, which is like being a fighter and never learning to use your left.

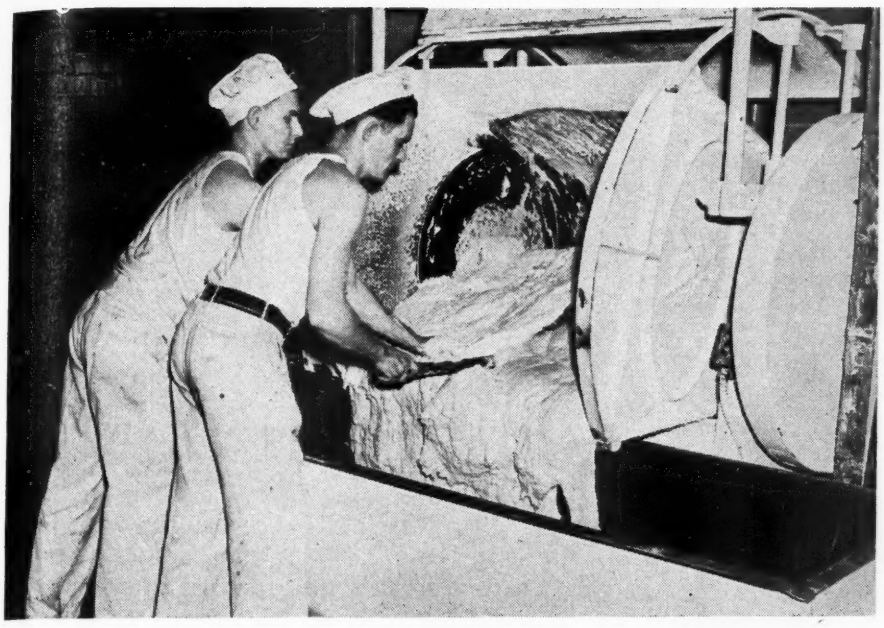
Learn to use the knowledge available in trade journals, manufacturers' pamphlets, government pamphlets and the like. The reference room of any good public library always has a volume called The Industrial Arts Index which lists a huge number of articles dealing with all phases of industry, its production and its raw materials. The librarian will be very glad to show you how this index is used.

A Scrap Book Is Worth While

Another thing of value to you would be to start a baking industry scrapbook, or a clipping file. Put into it news items clipped from the papers, from magazines, from trade journals—items about the other companies in the baking industry, as well as your own. While you are broadening your view of the nature of shop operations, you should also be getting a picture of the rest of the firms in the industry, at least those in your own geographic area. You ought to know something about these companies, their good points and their bad, for it will provide you with a better yardstick by which to judge your own employer, and the industry.

While not likely to have any direct benefits, it nevertheless seems to the writer that you would find it worthwhile to read a little about the history of baking. The industry you are in is an old and honorable one.

You should learn to spot trouble in the shop before it happens, and to recognize from the appearance of the finished product what went



The first step toward advancement for young men such as these mixers, is to gain a thorough understanding, not only of their job, but of the machinery used in that job.

wrong and how to correct it. You should be familiar with the way in which the production order is made up, and how the baking schedule is arranged from it.

Practice Tasting

And, from day to day, why shouldn't you be sharpening up your sense of taste? The final test of any bakery product is the buyer's reaction to the taste of it. You ought to be training yourself to judge the quality of many things by the taste of them. It is not necessary to swallow everything you taste; in fact, if you start out that way, you'll shortly be cutting down the amount of tasting to the vanishing point. Over a period of years you will inevitably ruin your digestion if you swallow everything you taste. The correct procedure is to simply chew it around in the mouth for a moment or two, get the full flavor and feel of it on your tongue, then spit it out. Watch for any taste that may be undesirable and yet develop a few minutes later in the mouth.

Also, while on the subject of tasting, become acquainted with the taste of your product when it is two or three days old, for that is likely to be the age at which most of your customers eat it. Too many bakers are content to sample their foods when they are only a few hours old, which is a practice not at all likely to give a true picture of the taste quality of the product as the consumer sees it. A longer time produces unavoidable flavor changes.

Practice Baking at Home

Another thing in the nature of an "after-work" activity that you, as a mixer heading for a foreman's job, can do to help yourself is the following. Probably most of your experience has been gained in medium to large shops, where the operations are highly mechanized and sharply divided one from the other. If this has been the case, it would be smart on your part to get a little hand-operation experience. Why not get it right in your own kitchen? Do enough baking at home to know what it really takes to turn out a professional product. Make some pies and cakes. Make bread and sweet doughs. Try your hand at Danish pastry and some of the specialty items.

You'll acquire handcraft skill and also you'll be putting in 100 per cent of the work on the product. There won't be any scaler, oven man or foreman to guide you or relieve you of responsibility. You'll gain more than just skill—important as that is—for the experience will increase your taste sense considerably and also give you an idea of what your main competitor, the housewife, considers good baking to be. You can't help but go back into the shop with a different point of view, quick to catch some of those things which bakers do to the detriment of their product. As for getting the housewife's point of view on what constitutes good baking, that won't hurt any man who is going to work in a responsible position in the baking industry, either.

You have, of course, a certain amount of time outside your working hours. Sleeping, eating, being with the family or the girl friend take a sizeable slice out of those hours. Nevertheless, somehow you must get time for keeping brushed-up on the important new developments, both in your specific field of baking, and in the general field of the food industries. Do this by reading regularly two or three journals covering baking and the food industries.

Handling Men—Part of the Job

So much for the technical side of the job. There is, however, your relationship to the other men in the shop. A foreman handles men. Don't forget it. You must, therefore, be able to work easily and well with men. What can you do to help yourself here? You ought to get along well with other men, but not at the expense of losing their confidence in you, nor their respect for you. You must show courtesy and consideration for others, yet hold your own.

Thinking before you speak is always wise, but even more to be desired if you are going to hold down a supervisory job. You must be a good worker yourself, knowing more than the others, yet resisting the temptation to be a "show-off."

You should be willing to learn wherever possible, to acknowledge your own mistakes and promptly correct them. You should be a morale builder where the other fellow is concerned.

The Boss May Be Right

There will be times when some of the actions of your employer may seem strange. Try to understand his point of view in such cases; try to understand his problems in connection with the operation of the business. If you were sitting behind the boss' desk, if you were in fact the boss, might you not be forced to handle any given situation much the same as the boss has handled it? Possibly not even as well, for of this one fact you may be absolutely certain: No man is going to be the boss of a going, prosperous business for very long if he is much of a dope. Give him credit for possessing probably more intelligence than most of the men who work for him.

Foremen Don't Sound Off

In the same sense, try to discover the reasons behind company policies. Make an effort, a sympathetic effort, to find out why things are done as

(*Turn to page* 214)

PREVIEW OF EXHIBIT 20th Chemical Show

Highlights of equipment and materials to be exhibited at the 20th Exposition of Chemical Industries, Grand Central Palace, New York, from February 25 to March 2. For your information, a list of some of the exhibits is given

By L. CHARLES MAZZOLA
Associate Editor, Food Industries

MEN who have to grapple with and solve the problems of production will find a real treat in store at the coming exposition. In the short space of a few days you will be able to see the progress that has been made in equipment and materials. Under one roof you will literally view hundreds of machines, gadgets, materials and services. Think of the time involved and the cost of travel if you were to visit the various cities to see this same equipment.

This particular show will surpass former expositions, which have always been informative and helpful, in that, for the first time the numerous developments which took place under pressure of war can now be shown in their peacetime application.

At the show you will very likely find the answer to a perplexing problem on which you have worked without success. Also, and equally important, there will be ideas for the solution of other problems with which one is plagued.

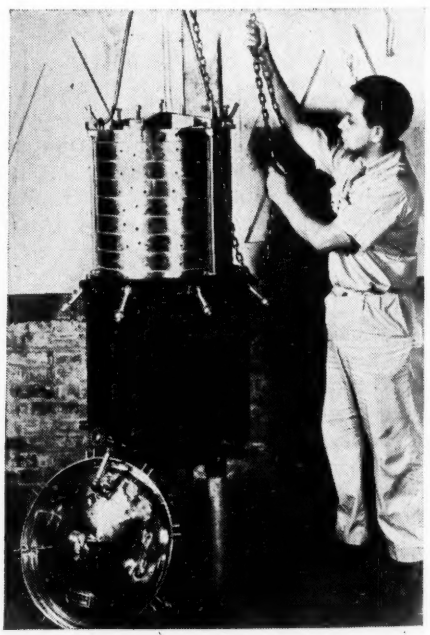
You will see machinery, covering practically all of the many processing functions. You will be able to talk to the men who are responsible for them.

Control equipment, pilot plant and full-scale equipment will be displayed and in many cases actually demonstrated. Differently designed equipment to perform a given function will be found. Here will be an excellent opportunity to see and understand how some of this equipment works by seeing the sequence and the function of each operation. Watch how different approaches produce the end result desired. One can see why one piece of equipment will work best with a certain product, under a given set of conditions, while another will work better for another operation.

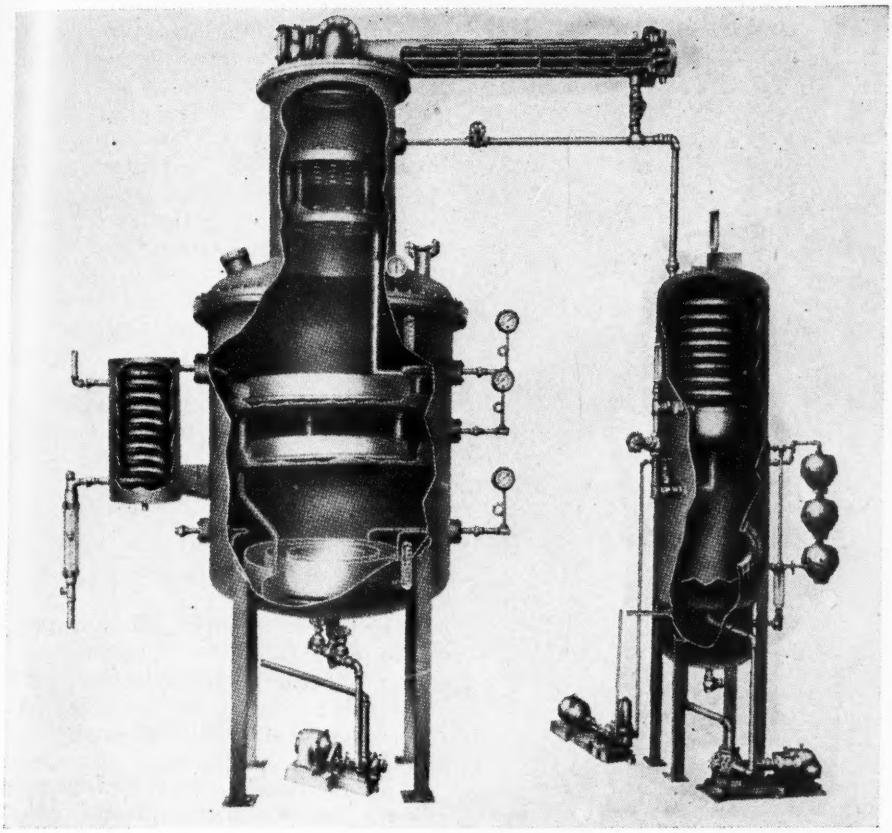
Materials that open new horizons will be shown. Not only will individual materials for particular purposes be found but entire groups of new materials will be shown. Packaging materials alone, will be worth the entire trip. The exhibit will cover most thoroughly new packaging equipment and supplies.

When you come to the exposition, stop at FOOD INDUSTRIES Booth, No. 42, where members of our staff will be in attendance. We will be waiting to welcome you and help to make your trip a profitable one.

Sparkler Manufacturing Co., Mundelein, Ill.—A laboratory model filter will be exhibited and demonstrated. It has a special glass tank enabling the process of filtration to be seen. The filter will be operated so that continuous or intermittent filtration can be vividly seen.



Sparkler filter press, showing plate cartridge unit being removed for cleaning.



Continuous concentrating device.

Artisan Metal Products, Inc., Boston 10, Mass.—Equipment for continuous operation. Several pieces of equipment will be displayed among which will be a continuous concentrating device here shown. It is used primarily for separating solvent from an oily product, and is used for handling vitamin concentrates, extracted vegetable and animal oils and other applications in the food industries. A sanitary design made from stainless steel has been developed. It is intended for all evaporating and concentrating processes in the food industries.

The equipment has a desirable characteristic of minimum hold-up and minimum time under evaporative conditions. It fits well to continuous processing and can be fitted to continuous lines.

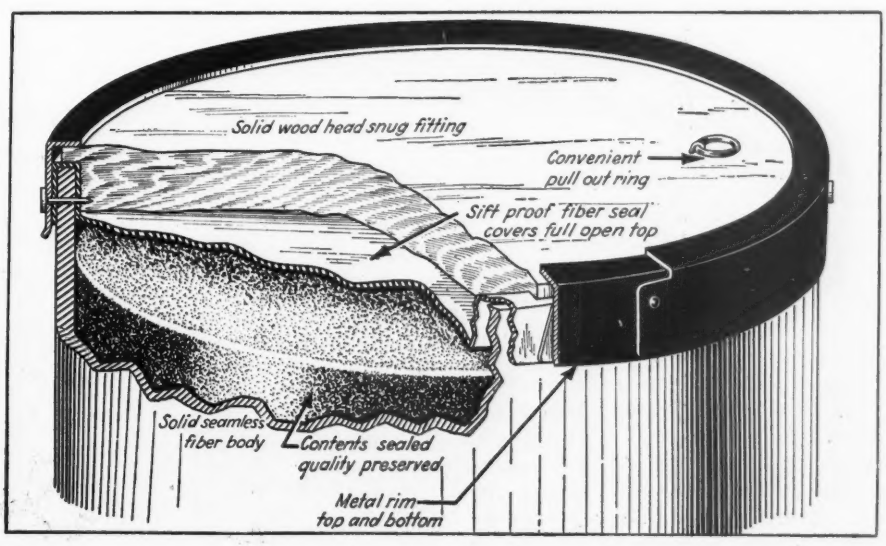
The feed is preheated and then enters on the top evaporator plate where it is evaporated and tends to flow around the plate and drops to the plate below and, continues on its way in a continuous path with increased concentration until it reaches the bottom outlet, at which point it is practically depleted of solvent and is pumped out of the still. The bubble cap scrubber at the top serves to scrub the vapors and give a clean overhead solvent product that, in turn, is condensed and discharged in the equipment by means of a wet vacuum pump and the controls on the vacuum tank.

Carpenter Container Corporation, 137-147 Forty-first Street, Brooklyn, 32, N. Y. Fiber drums suitable for food products. Several new types will be featured in this exhibit. The line includes a drum for bulk products, such as lard, fondants, icings, shortening compounds, pie fillings, sirups, banana powders and dry molasses. Also, on display will be the new Lok-Rim closure, for all types and sizes.

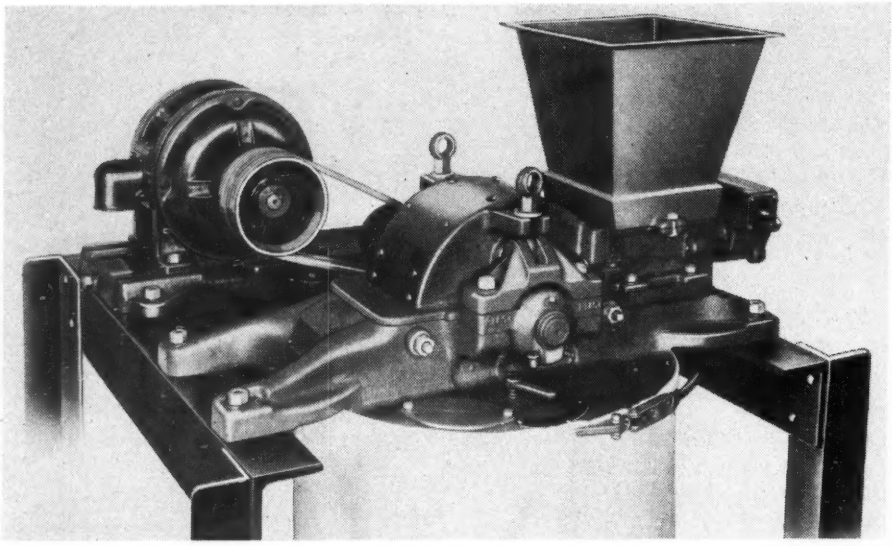
Separations Engineering Corp., 110 E. 42nd St., New York 17, N. Y. —This exhibit will contain a number of material separating machines. Among them are the following: Sutton, Steele & Steele air table which is extensively used in the food industry for the separation of deleterious material, either heavy or light, from such materials as wheat, beans, rice, coffee, cocoa, and all grains, seeds and nuts. Another machine that will be on exhibit will be a stoner that will handle up to 30,000 lb. per hour of grain for the removal of stones, or other extraneous material. A high-intensity magnetic separator and a multiform grader will also be shown. The grader gives multiple gradings of any kind of materials that are smaller than 8 mesh and coarser than 200 mesh.

Mixing Equipment Co. Inc., 1024 Garson Ave., Rochester 9, N. Y.— A large selection of photographs of equipment and installations, and a continuously operating motion picture, in full color, entitled "Technology of Mixing" will be the features of this exhibit. Many demonstrations not previously shown will be included.

Of particular interest will be a full-sized turbine-type impeller with removable blades. Also, a new type of agitator drive with simplified shaft design for easy removal and replacement will be displayed.


Solid wood head snug fitting
Convenient pull out ring
Sift proof fiber seal covers full open top
Solid seamless fiber body
Contents sealed quality preserved
Metal rim top and bottom

Lok-Rim fiber drum.



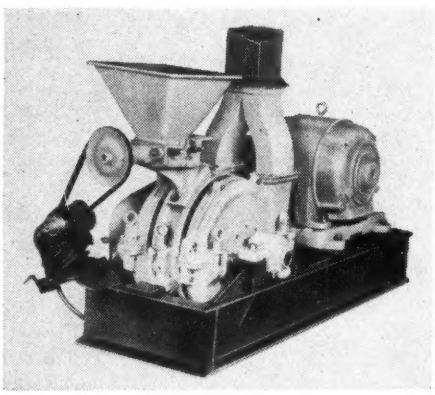
Mikro-pulverizer mill.

Pulverizing Machinery Company, Chatham Road, Summit, N. J.—Mikro-pulverizers. This company will occupy Booth No. 247 and will display their standard line of this equipment. In addition, they will announce and display the new Mikro-atomizer. This is an entirely new mechanical stainless pulverizer for production of ultra-fine powders from 1 to 25 microns. Their present line of pulverizers will produce grinds from coarse disintegration to controlled grinds of various finenesses down to products analyzing 99.94 percent through a 325 mesh screen (44 microns). The new Mikro-atomizer picks up here and will, on many products, produce grinds in the low micron range.

The main attraction of the display will be the No. 5 and No. 6 Mikro-atomizers. The No. 5 unit is the smallest of this line having capacities ranging between 15 and 100 lb. per hour, whereas the No. 6 unit is an intermediate mill. Its capacity ranges from 100 to 1,000 lb. per hour. A larger No. 8 unit is now in the process of development and should be on the market within a year. This unit will have capacities from four to five times those of the No. 6 unit.

The following partial list gives an idea of the number of foods that can be handled by this line of pulverizers:

Cane, beet and corn sugars; vanilla beans and sugar; chocolate, cocoa and other mixtures; malted milk; food colors; wheat, other grains and soy beans; starch, peanut butter, cheese; dog food or rations; fruits, vegetables; macaroni, dried milk and soups.



Mikro-atomizer mill.

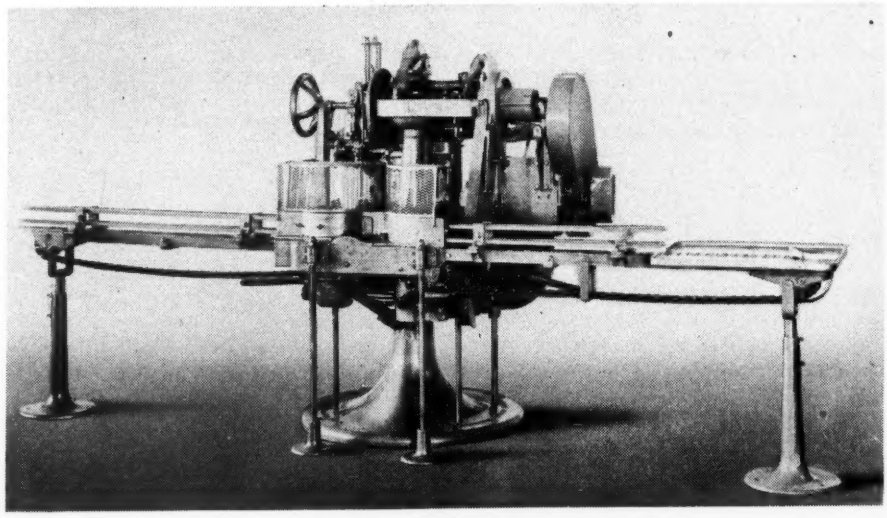
Economic Machinery Co., Worcester, Mass.—In this exhibit will be several of their World Labelers. The Bee-Line Labeler is especially suited for glass-packed foods, preserves, condiments, etc. It provides full automatic application of front, or front and back, labels; to round, square, flat, oval or panel bottles or jars. It conducts each container through the entire labeling operation in a bee-line. The containers are evenly spaced and there is no chance of collisions or traffic jams. It is ideal for quantity labeling on the modern lightweight glass containers.

The World rotary labeler is widely used for mass production of round bottles and jars.

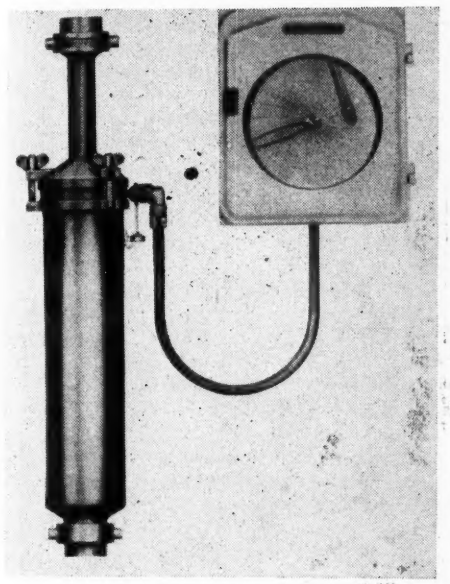
American Hard Rubber Co., 11 Mercer St., New York 13.—This display will include hard rubber pipe and fittings and other hard rubber materials. Pipe, fittings, tubing and fittings, rods and sheets made of Saran, will also be exhibited.

Fischer & Porter Co., Hatboro, Pa.—Sanitary rotameter, liquid proportioner and automatic controller of liquid flow rates as low as 10 ml. per minute will be exhibited.

The rotameter measures the flow rate of milk and other liquids and meets the sanitary requirements of the dairy and allied industries. It is equipped to indicate remotely, to record and automatically control the flow of milk or other liquids. The illustration shows the stainless steel metering body that is inserted in the milk and also shows the instrument that is connected to it electrically but which may be placed at some remote place. The line is made entirely of stainless steel and is equipped with standard sanitary fittings. The liquid flows straight through the instrument from bottom to top. There are no elbows or crevices where any pocketing can take place.



Rotary mass production labeler.



Sanitary rotameter.

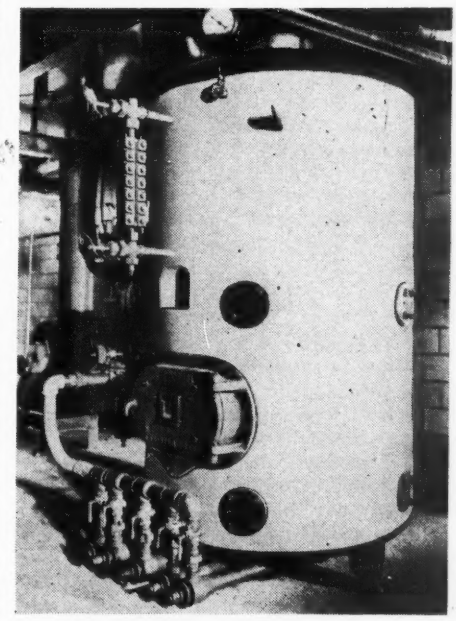
The proportioner automatically controls the relative flow of two or more liquid food products. It will deliver proportionally at a constant ratio to each other two or more liquids. It has been used to automatically proportion egg solutions to vinegar and corn oil in the manufacture of mayonnaise. It has also been used to proportion milk to oil solutions in cheese manufacturing.

Wallace & Tiernan Products, Inc., Belleville 9, N. J.—Methods of control of microbiological quality of process and cooling waters will be featured in this exhibit. Some emphasis will be placed on the importance of treatment of these waters in the food processing plants.

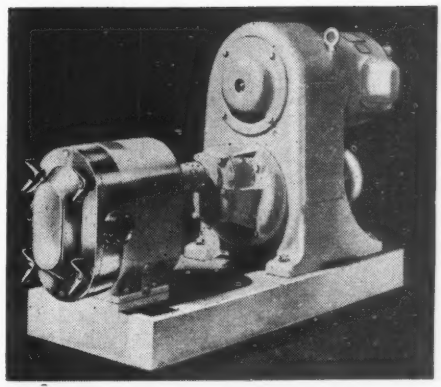
Sarco Company, Inc., 475 Fifth Avenue, New York 17, N. Y.—Steam traps, temperature regulators, strainers, and hot and cold water mixing valves. A complete line of these products will be exhibited in Booth No. 11, on the ground floor. These items are used in the food industries on cookers, exhausters, retorts, dryers, dehydrators, pasteurizers, water heaters and similar equipment.

Eclipse Fuel Engineering Co., Rockford, Ill.—A packaged-type of a McKee Dowtherm Vaporizer will be shown. This unit is shipped completely assembled and ready for use. There is no field erecting to be done. The unit is ready for use after connections are made on the fuel line, chimney, flow and return lines.

The Dowtherm is heated in the vaporizer to the desired pressure. The vapors are piped to the heat exchange apparatus in much the same manner as is done with steam. The principal difference between Dowtherm and steam is that the former boils at 500 deg. F. at atmospheric pressure. When heated it forms vapor, just as water forms steam when heated. At a temperature of 650 deg. F. the vapor pressure of Dowtherm is 55 lb. gage. The pressure of steam at 650 deg. F. temperature would be over 2,000 lb.



Packaged-type McKee Dowtherm vaporizer.

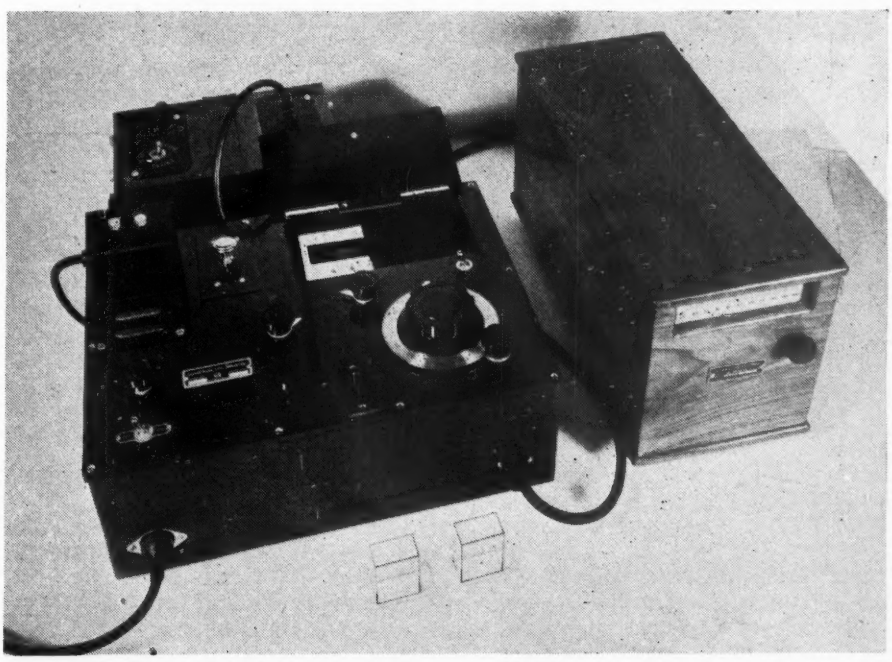


Variable capacity sanitary pumps.

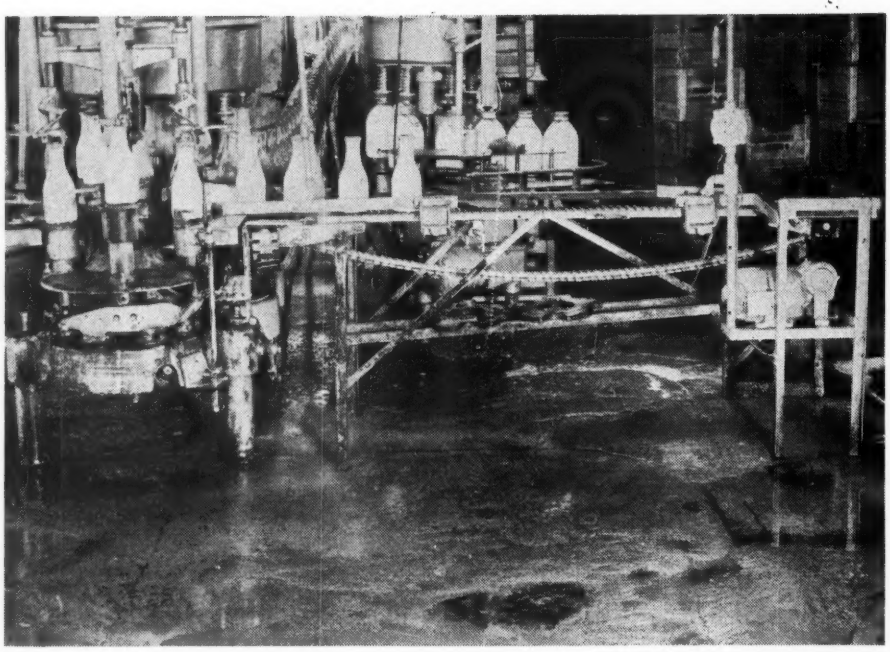
Waukesha Foundry Company, Waukesha, Wis.—All-purpose, ball bearing sanitary pumps will be exhibited and demonstrated.

Allegheny Ludlum Steel Corporation, Brackenridge, Pa.—On display at Booth No. 296 will be stainless steels, tool steels, electrical steels and carbide metals.

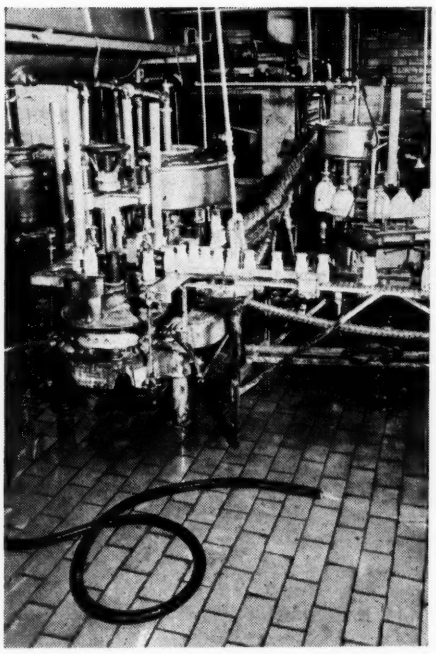
Photovolt Corporation, 95 Madison Avenue, New York 16, N. Y.—Control Instruments. A number of their control instruments will be demonstrated. Among them will be several models of the photoelectric colorimeter which are used in the standardization of color of liquids such as wines and fruit juices. Also shown, will be a photoelectric fluorescence meter which is used principally in measurement of Vitamins B_1 and B_2 in food materials.



Photoelectric fluorescence meter.



A dairy floor badly broken up.



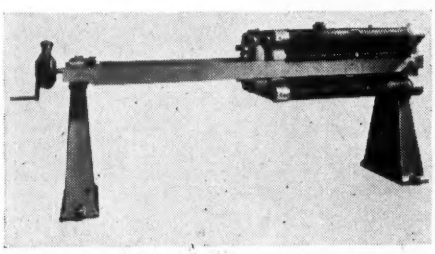
Same dairy with glazed brick floor.

Maurice A. Knight, Akron 9, Ohio —This exhibit will consist of materials and equipment which are acid and alkali resisting. Among them will be a new type of cement that has been developed to be used with brick or wood block to provide a jointing material. It is non-porous and extremely resistant to strong alkalis used as cleaners, steam heat and any acid conditions encountered in the food industry.

Haveg Corp., Newark, Del.—The exhibit, occupying Booth 51, will show tanks, pipe, valves, jets, fume ducts, pumps, filters and a number of special equipment parts made of molded plastic. The material is especially notable for its resistance to acids, alkalis and most solvents.

Walker-Wallace, Inc., 14 West Utica Street, Buffalo 9, N. Y.—Plate heat exchangers. Various models will be shown in Booth No. 572. This equipment is used in the food field and is suitable for pasteurizing any liquid and for cooling, chilling and heating.

It is particularly adaptable in new processes, such as high temperature sterilization of juices to a temperature as high as 260 deg. F. by hot water circulation a few degrees higher, then cooling by regeneration to approximately 200 deg. F. for filling. The cooling is accomplished by the raw juice that is being heated at the same time. Grape juice is heated to pasteurizing temperature and cooled back to 30 deg. F. all in one operation and with continuous flow.



Courtesy of York Corp., York, Pa.

Plate heat exchangers.

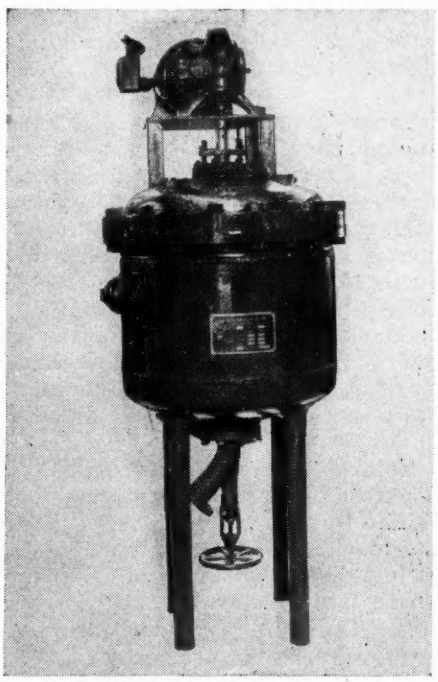
Some of the products handled are apple juice, orange juice, grapefruit juice, wines, liquid eggs, sirups, oils, vinegars, distillers mash, distillers stillage, brewers hot wort coolers, beer chillers, yeast coolers, sugar heaters and blood plasma chillers.

Fisher Scientific Co., Pittsburgh, Pa., and **Eimer and Amend,** New York—New apparatus and reagents for laboratory use. Some of the items that will be shown are: Fisher Titrimeter for volumetric analysis, an electronic device which eliminates the human element in detecting endpoint in titration procedures and an electrophotometer for colorimetric analysis.

The Dicalite Co., New York—Diatomaceous filteraids for thorough and fast clarification of liquids. There will be displayed, in Booths Nos. 86 and 87, nine grades of filteraids to meet the requirements of desired clarity in various liquids.

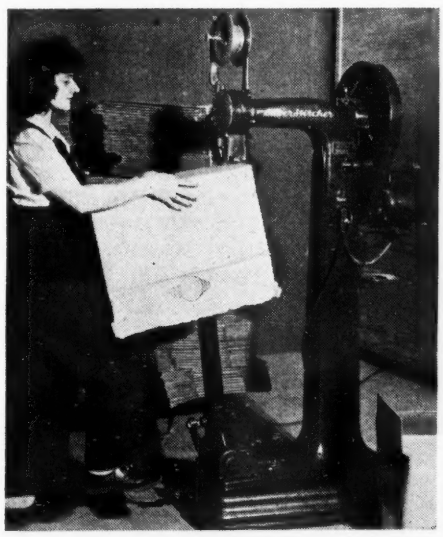
Dicalite No. 4200 which was discontinued for a time will soon be available to food processors. Chief users of this material include brewers, dairies, vitamin manufacturers and sugar refiners.

The Patterson-Kelly Co., East Stroudsburg, Pa.—A 100-gal. steam-jacketed mixing kettle will be exhibited. It is constructed of No. 316 stainless steel with the jacket of carbon steel. The kettle is equipped with a bolted-on head, turbine-type agitator.



Steam-packeted mixing kettle.

45-degree angle stitcher.



Bottom stitcher.

Acme Steel Co., Chicago 8, Ill.—Stitching machines. Among the several machines to be exhibited will be the conventional carton bottom stitcher for corrugated and solid fiber containers. It is equipped with the clincher post that always remains rigid and in perfect alignment with the wear-compensating lever arrangement. In one operation a single treadle brings the clincher post into immediate stitching position and actuates the stitching mechanism.

Products that are shipped in bags, requiring the top sealed in a tight and continuous manner to avoid loss of material through seepage, are successfully stitched by the 45-degree angle bag stitcher which will also be shown.

Power-driven stitches, firmly clinched, are formed from a continuous length coil of stapling wire. A foot-operated solenoid control on the floor leaves the operator free to guide his work.

A strapping table, displaying steel-strapping tools, will be another part of this exhibit.

Hardinge Co. Inc., York, Pa.—A new automatic, backwash, rapid sand filter that is adaptable for food processing plants in the clarification of food wastes and liquors will be demonstrated. This sand filter can readily be used for the removal of light suspended matter from liquids now readily removed by the sedimentation process.

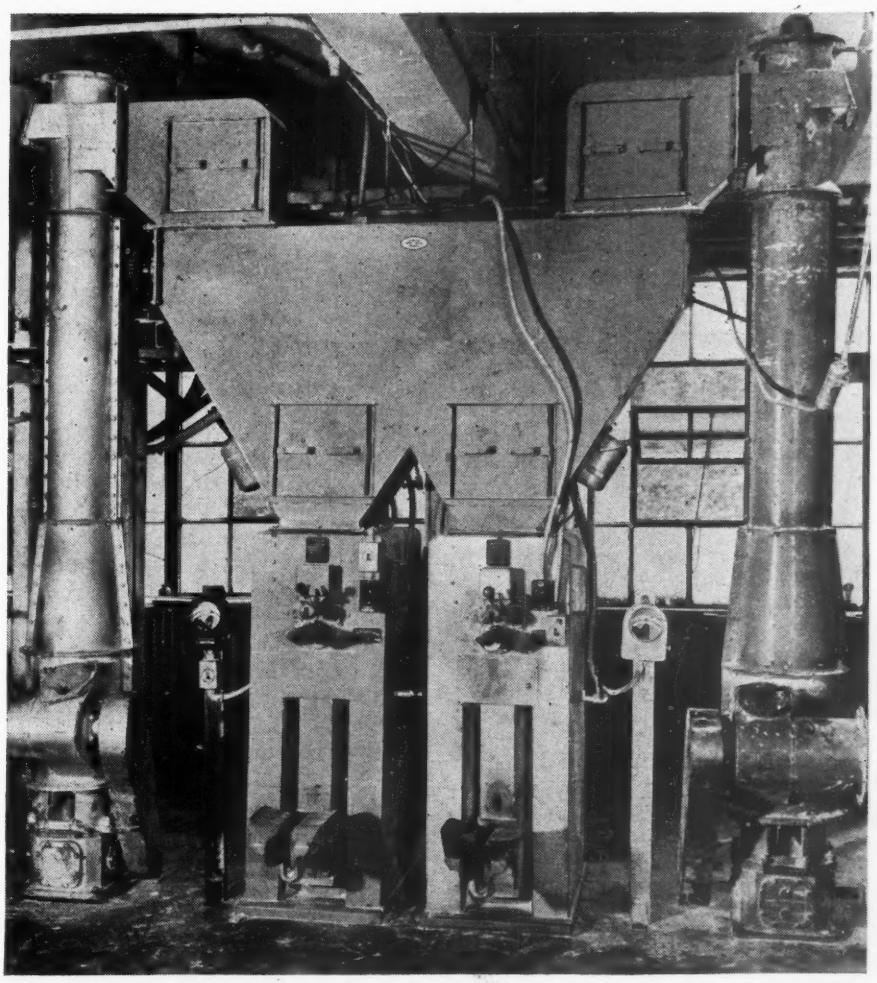
It consists of a specially compartmented sand bed with under-drains, together with an efficient backwash and cleaning mechanism traveling on tracks on the sidewalls of the filter tank, and accentuated electrically at predetermined differences in head.

Aso on display will be Ruggles-Coles rotary-type dryers.

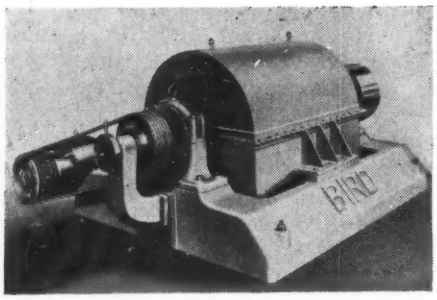
Pneumatic Scale Corp., Ltd., 117 Liberty St., New York 6, N. Y.—This exhibit at Booth No. 22 will not include any machinery, but the company is planning a mass display of sample packages and bottles to indicate the various types of containers that can be handled on the machinery they manufacture. This includes equipment to clean, fill, cap and label bottles; also, carton feeders, bottom scalers, carton lining, automatic weighers and fillers, top closures and other combinations.

The St. Regis Paper Co., 230 Park Ave., New York.—Paper bags and bag packing machines. Occupying Booths Nos. 531 and 532 at the exhibit, this company will show about 200 food products and other materials packed in heavy-duty multiwall paper bags.

A valve bag packing machine will be demonstrated, supplemented by a display of large photographs of the machine in operation. A demonstration of the palletizing method of handling multiwall paper bags will also be given.



Valve bag packing machine.



Continuous centrifugal filter.

Bird Machine Company, South Walpole, Mass.—Continuous centrifugal filters will be demonstrated.

New Jersey Machine Corp., Hoboken, N. J.—Three of the labelers to be exhibited are: "The Pony Labelrite" which employs the vacuum principle for perfect register, has twin-roller gluerolls and is able to handle labels from postage stamp size to a 6 x 7 in. size.

"The Code-o-matic" which is a machine for imprinting code symbols or characters on labels for inventory and quality control. This unit does not perforate the labels, but merely imprints up to twelve characters on it.

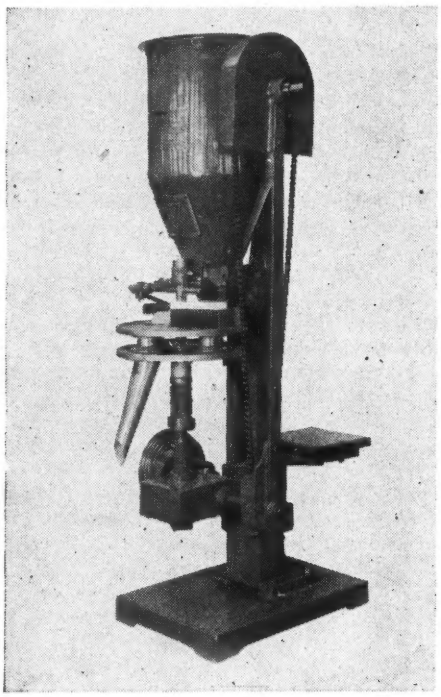
"The Table Gummer" which is a hand-fed, portable labeler. It is equipped with a self-cleaning device.

Niagara Filter Corp., 3080 Main St., Buffalo 14, N. Y.—In Booths Nos. 516, 517 and 518, a Niagara No. 440 all-stainless steel pressure-type filter, equipped with quick opening closure will be shown for the first time. Also, shown for the first time will be a general line of small filters with surface areas of 25 sq. ft. or less. These will employ either cloth-covered or all-metal pressure leaves, and will be equipped with pumps, supply tanks or not, to meet individual requirements.

In addition, the exhibit will include several other types of filters and a colorful display of hundreds of products sucessfully handled in Niagara Filters. Each case will be represented by samples showing the "before and after" condition.

The Container Company, Division of Continental Can Company, Van Wert, Ohio—Fiber shipping drums. Various types will be exhibited. The drums are all similar in construction but have different types of closures to serve different purposes. One uses a sealing disk with a push cover. When the cover is in place the joints may be sealed with ordinary kraft gummed-tape. Another has a friction metal cover with a lever for actuating the locking band. The third one has a lipped friction cover. It has eyelets which automatically engage the sealing lugs on body of drum. Each of the above three types comes in a number of sizes.

Triangle Package Machinery Co., 906 No. Spaulding Ave., Chicago 51, Ill.—Two improved filling machines for dry products that are of particular interest to the food industries will be on display. The auger packer is a streamlined, totally-inclosed unit, automatic so far as filling is concerned, flexible, and suited for filling powdered materials into cartons, cans, bags, bottles or jars.



Volumetric high-speed filler.

The other machine that will be displayed is the volumetric filler, which is designed to fill at high speeds, granules into any style container.

In addition, the display will include photographs and diagrams illustrating various installations in food and other fields that package all kinds of dry commodities.

The Wm. Powell Co., 2503 Spring Grove Ave., Cincinnati 22, Ohio—A line of corrosion resistant valves made of various types of corrosion resistant alloys or pure metals, including silver, will be displayed in Booth No. 54. Corrosion resisting valves in the food industry are indispensable. Not only because they resist corrosion and therefore have a longer life, but more important because they keep from contaminating the foods being processed.

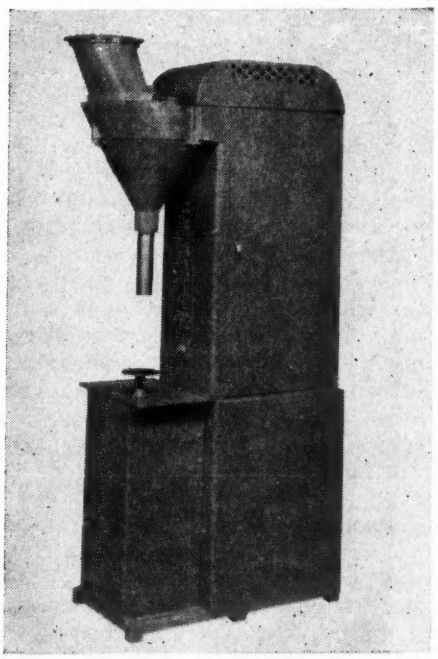
The exhibit will also include some bronze, iron and steel valves for handling products where corrosion is not encountered or where purity of the end product is not a factor, such as water, steam, fuel oil, gas and similar materials.

Kimble Glass Company, Vineland, N. J.—Laboratory equipment and glassware including Babcock and Paley test bottles and lactometers will be exhibited.

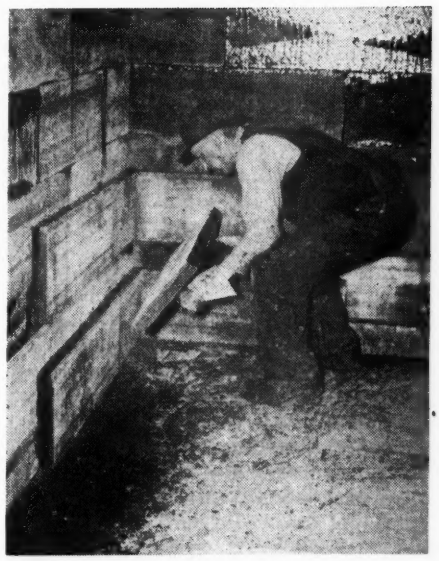
Globe Steel Tubes Co., Milwaukee 4, Wis.—Stainless steel tubing. This exhibit will be built around the use of stainless steel tubing in industry. It will center around the use of seamless and welded stainless steel tubing.

The tubing is made hot-finished and cold-drawn in sizes from ½ in. to 6⅝ in. O.D. Seamless pipe is made in standard, extra strong and double extra strong weights, in sizes ranging from ⅛ in to 6 in. iron pipe size.

It may be had with either the inside, outside or both surfaces ground and polished to various degrees of finish.



Totally-enclosed auger packer.



Installing asphalt-coated Fiberglas thermal insulating board in a cold-storage plant.

Owens-Corning Fiberglas Corporation, Toledo, Ohio — Fiberglas thermal insulating materials. Various forms of this product will be on display. These materials are manufactured at a natural density of 1½ lb. per cu. ft. A compressed material, bonded with a thermosetting binder to prescribe densities ranging from 2.25 to 9 lb. per cu. ft., producing lightweight semi-rigid and rigid boards is a product of this company.

Pressed Steel Tank Co., Milwaukee 14, Wis.—Cylinders, valves and drums. Representative types of these products will be shown. The line is regularly used for the storage and shipment of many foods. Many of the seamless containers are extensively used in the meat packing industry, the baking industry, and in many food dispensing establishments.

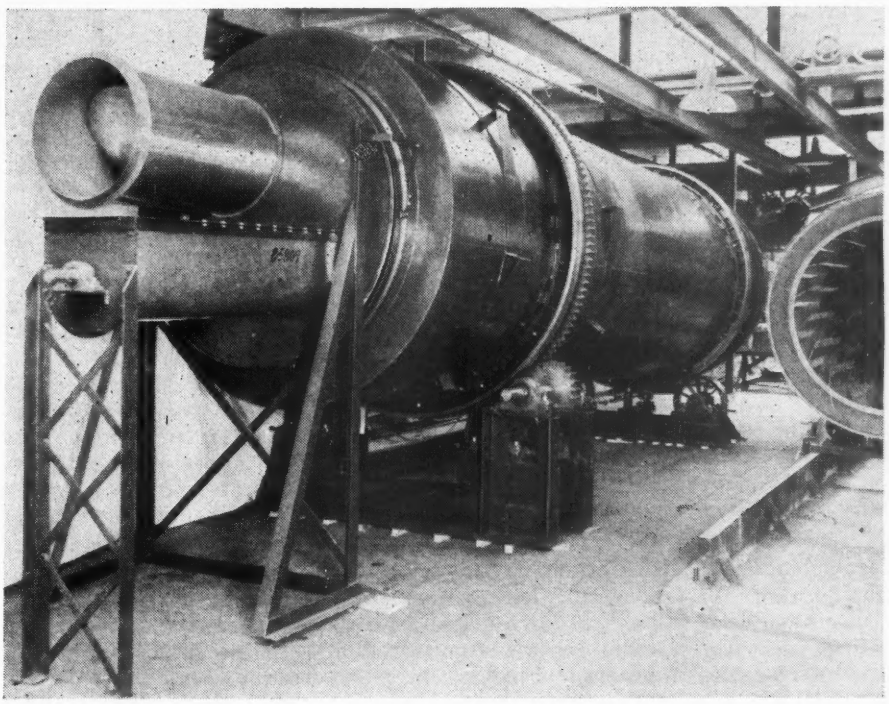
The seamless steel container is of particular interest to the food industry. Its seamless construction makes it especially desirable. Free from all cracks, sharp corners or rivets, it is easy to clean and keep free from residues and foul odors.

Stephens-Adamson Mfg. Co., Aurora, Ill.—Materials handling equipment. Some of the equipment to be shown will be a Redler conveyor elevator, designed to convey dry pulverized or flaky materials; speed reducers, totally inclosed, with drive motor, designed to be mounted directly on the end of practically any conveyor; and a swiveloader, that operates on centrifugal principle. It can be swung into a box car and will throw dry bulk materials, up to two inches in lump size, to the far ends of the car.

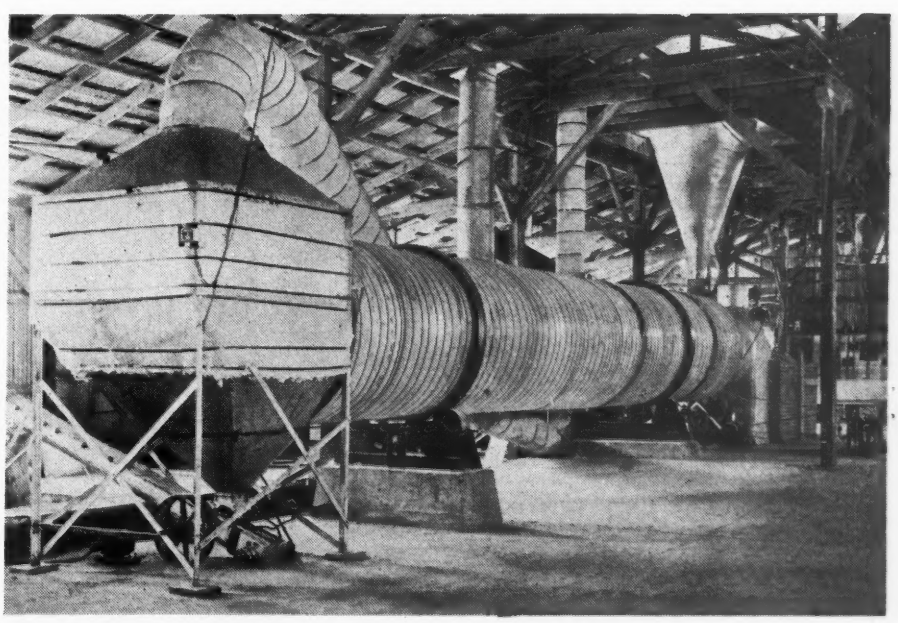
Televel is a bin-level switch. It is moisture-proof and is actuated by a light, accurately balanced float ball and will start and stop conveyors, elevators, pumps, etc., as the material level falls or rises.

F. J. Stokes Machine Company, Philadelphia 20, Pa.—Among other pieces of equipment, a high vacuum pump, a portable McLeod-type vacuum gage and a small vacuum drying chamber will be part of the exhibit in Booth No. 80. This apparatus will be operated to demonstrate the freeze-drying method for desiccation of blood plasma, penicillin, citrus juices and other food specialties. In addition, there will be on display, foods in tablet form.

Hersey Manufacturing Co., South Boston, Mass.—Continuous rotary dryers. The exhibit will include dryers used in drying salt, sugar, various starches and cannery waste.



Rotary dryer used in drying salt.



Continuous rotary dryer for sweet potato meal.

Control of Microbiological Food Spoilage By Fumigation With Epoxides*

By RITA WHELTON, H. J. PHAFF and E. M. MRAK, Division of Food Technology, University of California, and C. D. FISHER, Dried Fruit Association of California, Berkeley, Calif.**

PART II—The use of ethylene oxide to control microbiological spoilage in unsulphured dried fruits proved successful. Propylene oxide shows promise. The nature of the toxic residue left on fruit by these fumigants is discussed.

IN addition to experiments with microorganisms on agar slants and in solution, it was necessary to test the efficacy of ethylene oxide in killing yeasts and molds on fruit. For this, it was necessary to develop a method of counting approximately the number of organisms present on the fruit. The method used is described elsewhere.[18]

As a preliminary experiment, prunes heavily inoculated with yeast (about $4x10^5$ yeasts per prune) were treated with the ethylene oxide-dichloride fumigant in glass jars. Complete killing took place after exposure for 24 hours to 1 c.c. of the reagent per liter total volume at room temperature. On actively fermenting dates, with much larger numbers of yeasts present, it was found possible to kill all of the yeasts overnight by the same procedure. In the interior of figs, yeasts and molds are killed by similar treatment even when the eye is sealed with fig paste. These experiments indicate penetration of the fumigant into the flesh of the fruit, rather than mere surface sterilization.

Packaged Fruit Tests

Although dried fruit may be packed in glass jars or in tin cans, it is usually packaged in nonrigid wall containers of some sort, or packed in bulk in wooden boxes. When the war made it essential that food materials for overseas shipment withstand very rigorous treatment and storage conditions, much of it was packed in 1.5 to 2 lb. chipboard shells, 12 of these being placed in a fibreboard container dipped in a thermoplastic wax. This combination of materials is one of the best substitutes for tin or glass as far as insect infestation is concerned.

Our initial tests with fumigants to destroy microorganisms in packaged fruit were made with such containers. In laboratory tests, it was found possible to kill all organisms on the fruit by adding fumigant at the center of the large containers, one of the shells being lifted immediately before sealing and dipping. If the box was left standing for any period of time before dipping, some organisms survived the treatment.

To test the commercial applicability of the fumigation, master cartons containing 12 individual 2-lb. chipboard shells of prunes with 25 to 26 percent moisture were packed on the regular packaging line in a commercial plant at San Jose, Calif., in February, 1944. Immediately before gluing flaps and dipping in wax, dosages of ethylene oxide-ethylene dichloride solution in the range from 5 to 25 c.c., and ethylene oxide alone from 4 to 7 c.c., were added to the center of the master container.

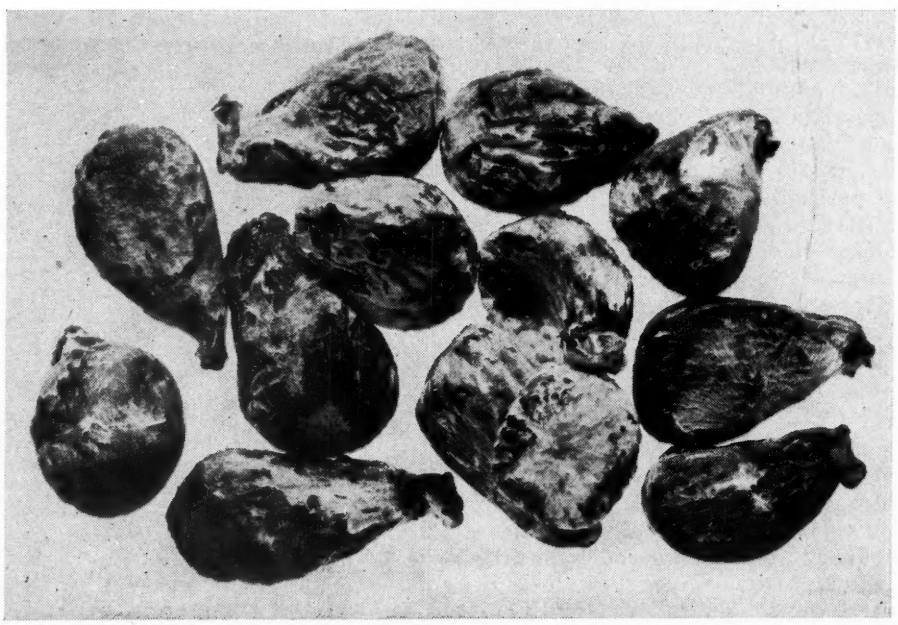


FIG. 1A. Black Mission figs of 30 percent moisture content, not fumigated, after five weeks of storage. The fruit is spoiled by molds and yeasts.

*Since publishing Part I of this paper U. S. Patent 2,075,845 (applied for on May 5, 1933, and patented April 6, 1937) issue to P. M. Gross and L. F. Dixon has come to our attention. They claim to have discovered the germicidal properties of ethylene oxide. This predates the work of Kirby, Atkin and Frey.

** A report on a joint research project of the Quartermaster General's Office, U. S. Army, and the University of California. This is in continuation of work initiated at the University of California in 1938.

To make the tests more rigorous, fruit artificially contaminated with yeast and mold was included in this and all subsequent experiments. This artificial inoculation was made by spraying heavily with suspensions of yeast known to occur normally on such fruit during spoilage, and by shaking the fruit with pieces already badly molded. The number of yeasts and molds on the inoculated fruit was far greater than would be found under normal plant conditions.

These tests showed complete killing of yeast with all of the concentrations tested, the inoculated controls showing about $2x10^8$ yeasts per prune. A few mold spores appeared to survive the fumigation, but it is possible that these were laboratory contaminants, because mold spoilage was never observed in any case upon prolonged storage.

A similar commercial experiment was tried in March, 1944, with figs of 24.5 percent moisture in 12-oz., inside-lined, chipboard packages, outside-wrapped with cellophane. Twenty-three of these were packed in an arsenal container. Before sealing and dipping, the fumigant was poured on a roll of corrugated board placed in the large container. The same concentrations were used as in the preceding experiment.

The test was successful, and the results were similar to those obtained with the prunes. When using the cellophane wrapped individual cartons, however, it was found that 5 c.c. of the 20 percent ethylene oxide solution in the master container represented a borderline concentration for effective killing of microorganisms. One container receiving this amount showed a little mold spoilage after long storage. None of the containers receiving pure ethylene oxide or larger amounts of the oxide-dichloride mixture showed mold growth.

As has been mentioned, ethylene dichloride is undesirable as a solvent for ethylene oxide when the mixture is to be used on foods, since it leaves a residue very disagreeable in odor, especially when the master container is relatively impervious to its vapors. Furthermore, in all of this work it was recognized that it would be of great advantage to be able to kill insects and microorganisms simultaneously. Thus, when a substitute solvent was desired, isopropyl formate, a widely used line fumigant, was tried.

Mixtures of this with 10, 15 and 20 percent ethylene oxide were made, the main advantage of these being the greater ease of handling, since they are liquids at room temperature. It is advisable to use fumigants with relatively high boiling points. Otherwise, in nearly empty drums a considerable part of the more volatile fraction will be present in the vapor phase, and the concentration of the active ingredient in the liquid phase will be decreased.

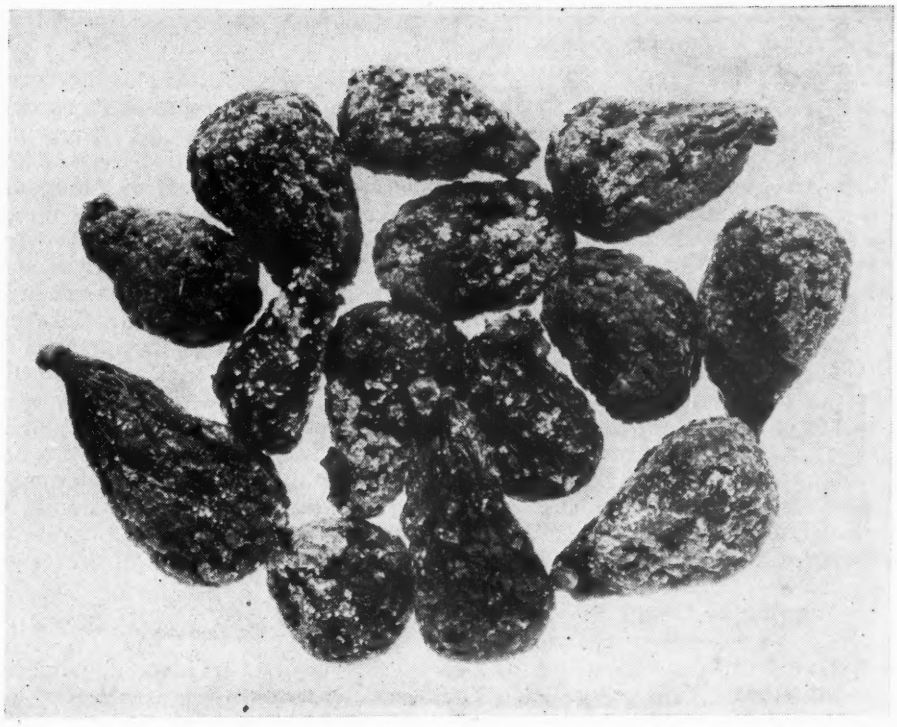


FIG. 1B. Black Mission figs of 22 percent moisture content, fumigated with isopropyl formate ethylene oxide mixture after several months of storage. No mold or yeast growth is detectable, but the product shows marked "sugaring."

In Table IV are given the boiling points of certain mixtures of ethylene and propylene oxides with isopropyl formate.

A large-scale packaging experiment was performed in September, 1944, with the isopropyl formate-ethylene oxide mixture using figs of normal (22 percent) and high (over 30 percent) moisture content. The figs were packed in 12-oz. cartons such as described above. Immediately before sealing, the fumigant was added to the packages by hand from specially designed pipettes. Several dosages were used, and controls with isopropyl formate alone, or with no fumigant at all, were included.

TABLE IV—Boiling Points of Fumigation Mixtures.

Gas composition indicated as percentage in mixture with isopropyl formate.

Gas	*Percentage*	*Boiling point, deg. F.*
Ethylene oxide*	10	118
	15	105
	20	92
Propylene oxide	25	136
	50	118
	100	95

* Boiling points of ethylene oxide mixtures reproduced by courtesy of Carbide and Carbon Chemicals Corp.

A total of 1,500 lbs. of fruit was packed so that the experiment would serve as an adequate practical test. Part of this fruit was artificially inoculated with yeast and mold.

Mold was evident in the unfumigated, high-moisture controls after storage for five weeks. (See Fig. 1A.) The high moisture fruit receiving isopropyl formate alone kept somewhat longer. It had barely started to mold in a few spots after five weeks. But after eight weeks, two packages out of five were completely molded, demonstrating the slight germicidal activity of the isopropyl formate alone. None of the high-moisture fruit treated with ethylene oxide showed mold growth during six to seven months' storage. As little as 0.5 c.c. of 10 percent ethylene oxide in isopropyl formate per 12-oz. package was found adequate.

In March, 1945, a patent was granted covering a number of methods for lowering the vapor pressure of a highly volatile sterilizing agent to be introduced into a non-breathing, moisture-proof container. It is stated that the gaseous agent completely dissipates through the container wall after a temporary sterilizing period.[17]

Prevention of Sugaring in Figs

In the experiment described above, the low-moisture figs, of course, supported mold growth less readily,

although eventually the controls did show some molding, especially those artificially inoculated. With this fruit, however, the occurrence of "sugaring" was very widespread. (See Fig. 1B.) ("Sugaring" is a term used to describe the crystallization of sugar on the surface of the fruit.) Frequently, but not invariably, considerable numbers of yeast cells are found in the sugary material.

This sugaring process constitutes a major problem in the prune and especially in the fig industry. Fruit which has sugared is objectionable in appearance and cannot be sold without additional processing. This not only involves further expense, particularly when sugaring occurs after packaging, but is also responsible for a loss of nutrients from the fruit.

Sugaring began in the low-moisture figs after about five weeks and increased gradually during subsequent storage. (See Fig. 1B.) The fumigant did nothing to inhibit this process in the low-moisture fruit, which is conclusive evidence that yeast growth is not a necessary adjunct to sugaring in figs. The yeast count on all fumigated figs was zero. Sugaring was enhanced by cooling the figs gradually to a temperature of 32 deg. F. It seems evident that in figs, at least, the sugaring process is purely a physical phenomenon, having nothing to do with microbial growth.

None of the high-moisture fruit showed sugaring unless it was allowed to dry to approximately 26 percent moisture. At this moisture level, which appears to represent a borderline concentration for sugaring, traces of crystallization may be observed. Thus, the use of fumigants to control the growth of microorganisms does make it possible to prevent sugaring in figs, since the fruit may be packed at a moisture content high enough so that no crystallization takes place.

Subsequent to this experiment, C. D. Fisher[17a] developed a commercial applicator for the ethylene oxide-isopropyl formate mixture which has been installed on a commercial packaging line. An experiment similar to that above was conducted with the applicator, and successful results were obtained.

Toxicology

When first introduced, ethylene oxide was tried as a narcotic, but was found poisonous.[18] In general, the toxicity of its vapors for higher animals is somewhat less than that of other common irritating gases, such as sulphur dioxide.[19] It is most likely to be harmful when low concentrations are present over a long period of time. In this case, damage to the mucous membrane of the eyes and respiratory tract may result.

A question which arises from the use of fumigants on foods is the nature of the residue they leave and its possible toxicity. According to various authors, the residue of ethylene oxide remaining after fumigation is not objectionable from the viewpoint of flavor or toxicity, although sufficient airing is desirable because of the great absorption of the gas.[20] Because of the extreme reactivity of this compound, however, it appears that it must in part form combination products with food components and in part be converted to ethylene glycol. It will react with numerous substances present in protoplasm and thus the nature of its toxic effect is difficult to evaluate.

There are many reports in the literature as to the toxicity of ethylene glycol and related solvents.[21] The lethal dose for adults is reported to average about 100 c.c., and it has been known to cause numerous deaths.[21] If one assumes that all of the ethylene oxide added to the fruit is converted into ethylene glycol, the concentration in the figs, when 0.5 c.c. of a 10 percent solution is added to a 12-oz. package, is approximately 0.02 percent. To obtain the amount of ethylene glycol reported lethal, it would be necessary to eat 1,000 lb. of treated figs. As a matter of fact, the actual concentration of ethylene glycol in the treated fruit is probably far less than 0.02 percent.

There is also the possibility that a chronic poisoning might occur from the regular consumption of treated foods. In reported studies on the chronic toxicities of glycols for rats,[22] the animals were given 1 and 2 percent ethylene glycol in their normal diets over a period of two years. Though there was somewhat higher mortality in the treated animals than in the control group, the dosage was calculated so that chronic lesions might be observed. Obviously, this amount is far from proportional to any amount which might be ingested in treated dried fruit, even though toxicity to man might be greater than to rats.

Fruit which has been fumigated with ethylene oxide may be reinoculated with mold, and the latter will grow without difficulty. This is evidence that no residue that is toxic to the mold is left on the treated fruit.

Propylene oxide is converted on hydrolysis to propylene glycol, which has much less toxicity than ethylene glycol. If the possible toxicity of the residue were in question, it would be advisable from this point of view to fumigate with propylene oxide. There does not seem, however, to be much need for concern over this point.

(*Turn to page* 228)

FIG. 1C. Black Mission figs of 30 percent moisture content, fumigated with isopropyl formate ethylene oxide mixture after seven months of storage. Neither microbiological spoilage nor sugaring is evident.

Does Instinctive Appetite Correct Science?

Recent findings seem to explain the unacceptability of whole wheat flour despite long and intense promotion. Maybe there are other equally sound reasons why such foods as soybeans remain unpopular

BY BERT D. INGELS, Consulting Chemist, East Orange, N. J.

THE activities of human instinct are not usually considered when food is prepared or served. Yet animals have well-developed instinctive appetites to which most owners cater very carefully.

Any dog raised as a house pet, when permitted, will sometimes rush to eat grass, much to the surprise of the mistress who has been carefully regulating the diet according to prescribed formulas. No other dog or person has taught the dog that grass contains substances that are much needed. This springs from the dog's inborn, instinctive appetite. On the other hand, animals have an aversion to undesirable foods and poisons. Anyone who has tried to eradicate rats or coyotes understands the difficulties of getting these animals to eat poisoned food.

Human appetite is most complex. What any individual eats and craves depends upon several factors, some of which are: Age, activity, and health; diet to which one is accustomed; foods available; one's mental condition; habits, such as gluttony or abstemiousness, and finally, instinct.

There is little need to dwell upon the first five of these interlacing factors, as they are already well-known and understood. But when it comes to the important *instinctive appetite*, few nutritionists give it any consideration whatever, when humans are involved.

Fundamental as instinctive appetite is to the life of infants and animals, students of nutrition usually fail to apply the lessons that might be learned to every-day menus. On the other hand, some nutritionists are greatly perplexed because a product, which according to their analyses and experience contains most desirable and important nutritive constituents, fails to be accepted by the general public.

The soybean is the classic example of the moment. Millions of dollars have been spent trying unsuccessfully to get the peoples of the world to eat products containing soybean flour and soybean grits. And what has instinct to do with this wanton waste of precious food in these times of scarcity?

What Is Undesirable?

Of all appetite factors, one possible answer is that soybeans are not desirable because people in general are not accustomed to eating them. Without instinctive appetites, there could be no other likely conclusion. On the other hand, if they do have such instincts, why does it tell them not to eat products containing soybean flour or soybean grits? What does the soybean contain that is undesirable? Here is a food that contains important desirables, according to competent chemical examinations, and elaborate animal feeding tests. The only proof thus far shown that it contains undesirables is traceable solely to human instinctive appetite. Yet there is a comparable example in an even greater food product, namely, bread.

For more than 100 years, some doctors, food fadists, nutritionists, millers, and bakers have been using every device at their command to induce people to eat whole wheat bread, rather than white bread.

Despite all this intensive promotion, the actual sales of such whole wheat products have not been more than 2 percent of the total white flour produced. Again the question arises: What has this to do with human instinct?

Fortunately, in the case of whole wheat, there is now available some evidence which seems to bear out the soundness of the reaction of the instinctive appetites of millions of people.

The bran or outer coating of the wheat berry is said to contain a complex organic phosphorous compound, known as phytin. Such analyses as have been reported in chemical literature show an average of around 5 percent phytin in clean, commercial bran, while the pure endosperm or floury portion is said to contain little or no phytin. If the bran represents 20 percent of the wheat kernel, then on the basis of these analyses, whole wheat products would contain about 1 percent phytin.

Two capable chemists in England, W i d d o w s o n and McCance, have shown by carefully conducted human feeding tests that the phytin in whole wheat bread will combine with the calcium and the iron in the food taken along with such bread, and form insoluble calcium and iron phytates during the digestive processes.

It has taken more than a century for scientists to discover that Dr. Graham's cure for inebriates—whole wheat bread—contained an undesirable ingredient, and to show why it was undesirable. During that whole period, the only protection the average person had from certain food fadists, doctors, and mercenaries was his own *instinctive appetite.*

Could it be possible that human instinct is still more informative than science? Will food chemists and others interested in good health and proper food make as vigorous a search for undesirables as has been made in recent years for nutritional benefits?

It's Time To Standardize Materials Handling Equipment

By NATHANIEL WARSHAW, Consulting Engineer,
Manager, Materials Handling Division, Market Forge Co., Everett, Mass.

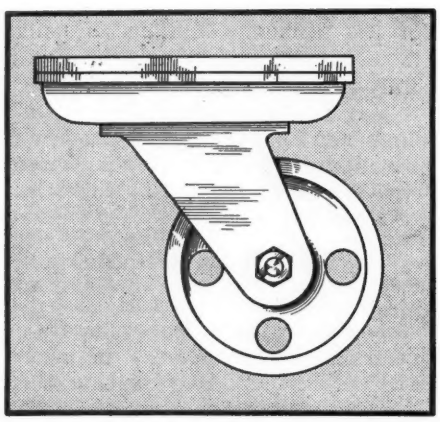
There are too many types and models of materials handling equipment, too many sizes of fundamental elements. Eliminate some of these, then unit costs and inventories are reduced and interchangeability of parts facilitated

WHEN an industry comes of age, and is a recognized effort in the growth of civilization, it is time for that industry to take account of its stock and lay a course which will produce even greater efforts. In some cases this happens naturally, or as the result of governmental regulation, or through the foresight of those in the industry itself. One of the most important means of accomplishing this result is through standardization of fundamentals. It has worked well in other industries and should likewise in the materials handling industry. Without standardization of fundamental elements, where would the automobile industry, the electrical industry, the textile industry, and other large industries be today?

Had we standardized in this industry ten years ago, many civilian industries would not have been deprived of critical equipment for handling materials and gross shortages for the military would not have occurred. It was necessary for the government to set up materials handling laboratories, and these should be continued by the industry in some manner. In this article I will treat a few fundamentals of the materials handling industry in which standardization is operable but, of course, there are many others that would be more advantageous.

Wheels

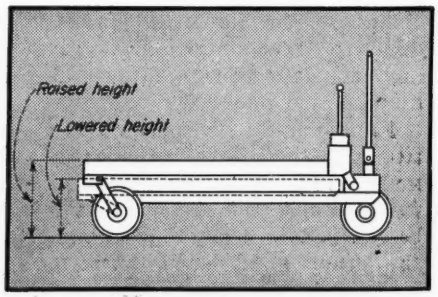
Wheels are fundamental elements in the manufacture of all portable materials handling equipment. Every manufacturer, nevertheless, has his own designs and sizes, preventing interchangeability of the parts of one with those of another. This necessitates the manufacture of many more wheels than are ever used. Costs are increased, maintenance is more difficult, and designers are handicapped by lack of standards. With the growth in use of non-metallic materials and rubber, in addition to iron and steel, the matter of wheel sizes certainly takes on a national significance. Automobile builders have standardized on wheels to the great advantage of the industry as well as the consumer. Why not this industry? Most manufacturers now make 4, 5, 6, 7, 8, 9, and 10 in. wheels in iron, plastic and rubber. Is this really necessary? Think of the savings and benefits if by mutual agreement the 5, 7, and 9 in. wheels were eliminated. Such standard wheels might come under the category of materials handling standards—just as we have standard threads and standard gages. Standardization is really the limiting of in-between sizes for the common good. This does not mean that special sizes are not to be made at all, but that the general consumer would not be affected by the extra cost involved. Eliminating three sizes really means the elimination of nine or more sizes when the other materials are considered.



Standardize casters by establishing over-all heights, top plate dimensions, and size attachment holes and hole spacing.

Now let us consider the matter of width or wheel face. A glance at a current catalog of one manufacturer shows he has the following sizes with nothing to indicate the availability of each: 31/32, 1 1/16, 1¼, 1½, 1⅝, 1¾, 2, 2⅜, 2½, 3, 3¼, and 3½ in. Another manufacturer has this unenviable list: 1⅛, 1½, 1¾, 1⅞, 2, 2⅛, 2¼, 2½, 3, 3¼, and 3½ in. What one has missed the other has added. Would it not be more sensible to adopt as standard something like the following: 1, 1½, 2, 2½, and 3 in.?

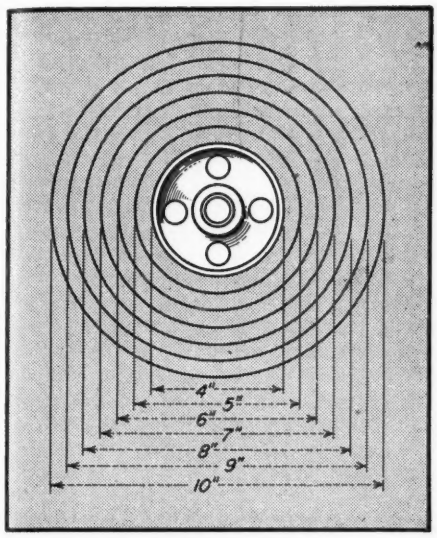
What a boon this would be to the rubber and plastic people who have to make expensive molds. Just as many wheels would be sold and just



The lift truck is the most susceptible to standardization.

TABLE I—Relationship in Inches Between Face Width, Axle and Bore of Wheels

Face width	1	1½	2	2½	3
Axle	½	⅝	¾	1	1
Bore for bearings	1 1/16	1 1/16	1 7/16	1 7/16	1 15/16



Are so many sizes necessary? Why not eliminate 5-, 7- and 9-inch wheels?

as many wheels would be used, but inventories would be decreased and unit costs lowered. The unfortunate part of cataloging various sizes with no indicated standards is that it does not give the buyer any criterion for judgment. Consequently, some of each kind will be sold and used as long as they are advertised. Specifying an industrial standard, however, acts as a signal to the buyer who can then tell which size he should specify. One company cannot do this alone. Agreement must be mutually followed by all companies in the industry.

The next function of a wheel is the bearing. Here we can take advantage of some of the standardization methods of the bearing manufacturers. They have made it possible through standardization to utilize the same bore for receiving a bearing with different axle dimensions. Let us consider the roller type bearing only, since it is most common, but the same procedure is possible with other types of anti-friction bearings. Incidentally, the materials handling industry should come out unequivocally for anti-friction bearings in load-carrying wheels, and not let the innocent buyer feel that the plain bearings of years ago are still efficient. There are some cases where they are necessary, but on the whole anti-friction bearings of one form or another have, through standardization, decreased so much in cost that the industry should be urged to use them on a more positive basis.

Speaking of bearings, you will recall that one of our prime targets in the war, which cost us many casualties, was the bearing manufacturing plants of our enemies. That is how important they were, and because our own Allies suffered similar losses of bearing plants, anti-friction bearings have been on the critical list until recently. To return to the record, it would be a simple matter to establish the axle sizes shown in Table I for a given wheel face, and to complete the chart it would only take three bearing diameters or three sizes of bores in the wheel.

Imagine the savings in tools and cost of manufacturing if most of the roller bearing wheels in use could be bored with only three sizes of tools!

Hub length, too, is important, since it is a space dimension of value to the designer. As the bearing manufacturers have standardized on length as well as diameter and furnish sizes equal to face width, it is only necessary to add ¼ in. to face width to obtain the hub length.

Casters

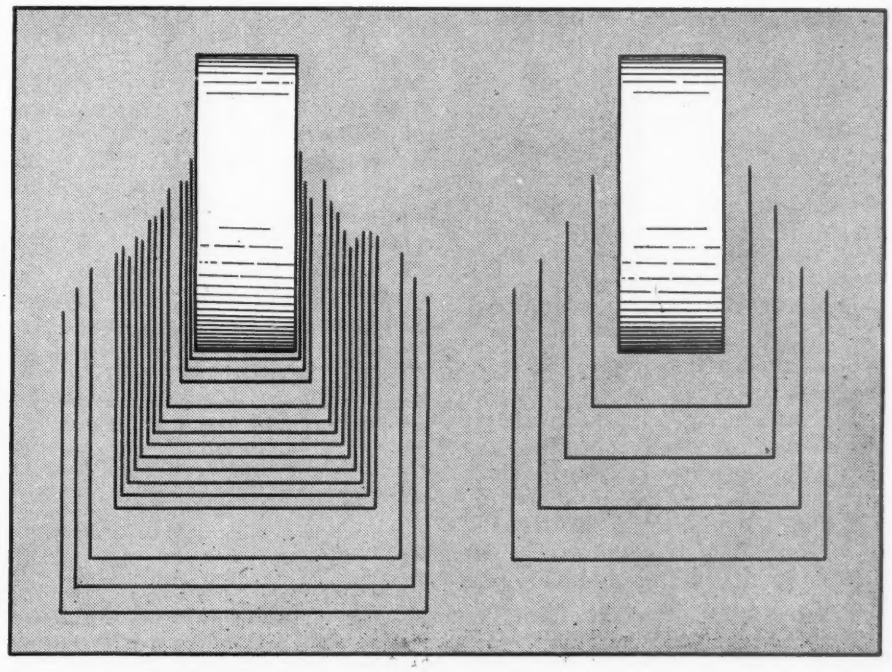
Just as wheels are fundamental elements in portable equipment, they are likewise fundamental in casters. Casters in themselves are fundamental, too, yet no concerted attempt has been made to standardize them. There is, however, a noticeable tendency in that direction on account of competition. Years ago each manufacturer apparently varied his dimensions deliberately, so that his product was distinct from that of his competitor. It made him feel that he had his customer hog-tied. He overlooked the fact that his competitor had closed the door to his product in a similar manner. Actually, neither gained, as the total number of casters sold and used was the same. The number of units sold and used is important, not the number manufactured and lying dormant on shelves in great variety.

With standardization the number manufactured can be held more closely to the demand, thereby preventing excessive inventories. As long as there is a free market, each manufacturer will continue to enjoy a volume depending on his design, quality, price and aggressiveness. Standardizing casters is very simple, even more so than wheels. It is merely necessary to establish definite over-all heights for the casters varying with wheel diameter, definite top plate dimensions and definite size attachment holes and hole spacings. As the trend toward duplication of interchangeable casters by various manufacturer is quite evident, it would take only a slight push in the right direction to establish materials handling standards for the entire industry, which could not fail to be of benefit to everyone.

The Lift Truck System

The lift truck system of all handling methods is the one most susceptible to standardization. Like many early innovations, it unfortunately received widespread use before its full importance was recognized. Some 15 or 20 years ago the Department of Commerce recognized that the lift-truck system could be an important adjunct to our

(*Turn to page* 220)

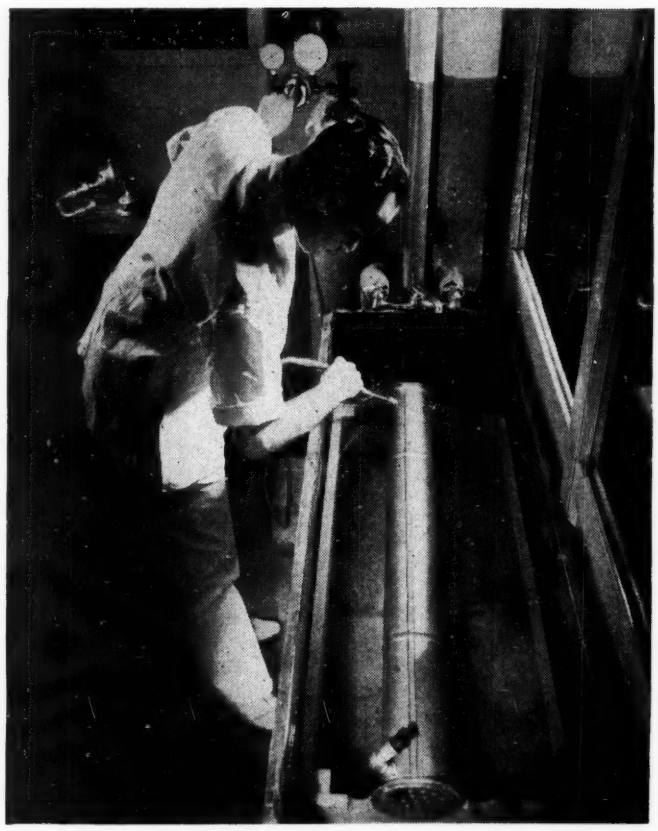


This? **or** **This?**

AQUA DESTILLATA,
Its Cost and Convenience

When water of high quality, low ion and bacterial content, free from organic matter and gases is required, distillation is almost essential. Here is information on the construction maintenance and operation of a battery of stills producing 2,500 gallons of distilled water each 12-hour day

By HALDANE GEE, Vice President
Schering & Glatz, Inc., New York



Units are periodically pressure tested. Cooler is shown submerged in tank to reveal any leaks.

WATER SUPPLY, although fundamental in the food and allied fields, is seldom given more than passing attention by food technologists. There are, however, many specialized products where water becomes more than a basic ingredient or processing agent. Its quality may make a considerable difference in such products when freshly prepared, or after a period of storage. Wherever difficulty thus arises with traces of metallic or organic impurities, it may be advisable to consider special means for water purification.

A common method of providing water of improved quality is the drilling of an artesian well. For some purposes, filtration will serve. Another method now finding increasing application is the use of one of the deionization processes capable of turning out low residue water. The distillation method, however, stands unequalled where the need is for water of the highest purity consistent with commercial volume. Distillation is almost essential where, in addition to low ion content, it is necessary to insure freedom from organic matter, removal of gases and minimum bacterial content.

Three-Still Battery

This article is a summary of experience with a water distilling operation over a period of years. It is offered as a guide in any situation where water is required free from trace impurities, and where distillation is being considered. The equipment reported on is a battery of three Barnstead continuous-type water stills, delivering 2,500 gal. of water in a 12-hour day, invariably exceeding in quality the requirements of the United States Pharmacopeia. These conditions are ideal for the operation of water stills. The water was required for pharmaceutical purposes and was used in the manufacture of dextrose and saline solutions for intravenous use. Similar stills might be used for water required in cosmetics, flavorings, extracts, beverages, or wherever water of extremely high quality is required or advantageous.

The raw water was taken from New York City mains. Total solids ranged from 30 to 80 parts per million. The stills were operated through all seasons. The distillate gave less residue on evaporation than the limit of 5 p.p.m. permitted by the seventh revision of the National Formulary. Operation and maintenance were managed so as to give values well within this residue limit at all times.

Of Continuous Type

The equipment used was of basic standard design, with a number of minor, although important features incorporated. The stills were Barnstead continuous-type, hard-water models, with a rated capacity of 75 gal. per hour. They were selected

Water as a food ingredient seldom receives proper attention by food manufacturers, and too often is disregarded even by food technologists. Where, however, it is used for intravenous food injections, any impurities may cause fever. This form of "food" must be manufactured with exceeding care. Water ingredient specifications are more exacting here than in any other food use. But pure water, at an unusually low cost, may help solve food flavors or precipitate problems in regions where natural water is excessively burdened with dissolved substances.—THE EDITORS.

following previous favorable experience with smaller Barnstead stills of 25 gal. rated hourly output.

Three or four stills constitute a convenient battery, with two or three stills capable of delivering the maximum needs at any time. More than four stills will ordinarily mean too many units to operate and maintain. If only two stills are being considered, each should be capable of supplying the anticipated maximum water requirements.

The Barnstead continuous commercial stills are similar in design to the usual continuous laboratory still of one or two gallon capacity. Raw water enters the condenser near the distillate outlet and is warmed as it passes through the condenser. The hot, raw water is led into the evaporator through a constant level device, with the surplus raw water overflowing into the drain. Most favorable operating conditions are established if the raw water feed and the steam pressure are adjusted so that a wisp of steam issues continuously from the condenser vent, and the distillate runs off slightly warm. These conditions insure maximum degassing of the water and most economical operation.

De-concentrator Feature

In addition to the constant level overflow, the hard-water types of stills incorporate two features which result in improved quality and minimize servicing. One feature is a de-concentrator or bleed cock on the evaporator, set for a continuous bleed at a rate equal to the rate of distillation. Although this may at first be considered wasteful, it is to be remembered that the bleed water carries off sensible heat only, which is a small part of the total heat requirement of the still. The bleed prevents rapid accumulation of solids and scale in the evaporator, minimizes foaming, and reduces the possibility of entraining solids in the vapor.

Spray Separator

The second important feature of the hard water still is the use of an efficient baffle unit within or above the evaporator, which separates mist or spray from the vapor and thus, keeps non-volatile material out of the condenser. The larger stills are usually easier to operate foam-free, as there is more headspace in the evaporator.

Commercial stills are built of heavy gage materials with flanged joints and reinforcing rings. The condensers are water tube rather than vapor tube, for increased efficiency. They are supplemented with coolers, tube-type or coil-type, connected counter-current for most efficient heat exchange.

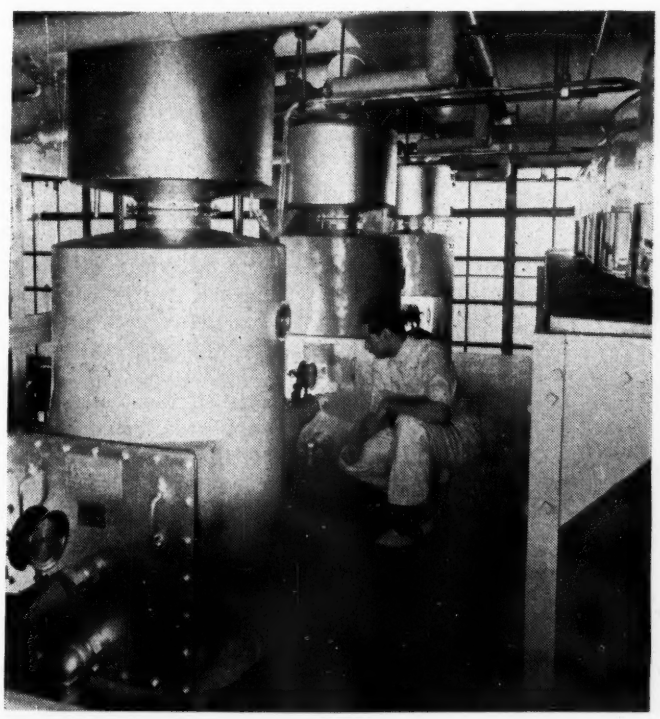
Special provision was made for simplified inspection and maintenance. The evaporator heating coils were built for 45 lb. steam pressure, necessitating the use of fairly large coils. Mounted on the manhole cover, the entire coil comes out when the cover is removed. Double unions were used on the steam supply and return lines to facilitate a removal of the outside pipe connections. This gives unobstructed access to the interior of the evaporator and minimizes strain on the coils in the event of imperfect alignment.

Sight Glasses Installed

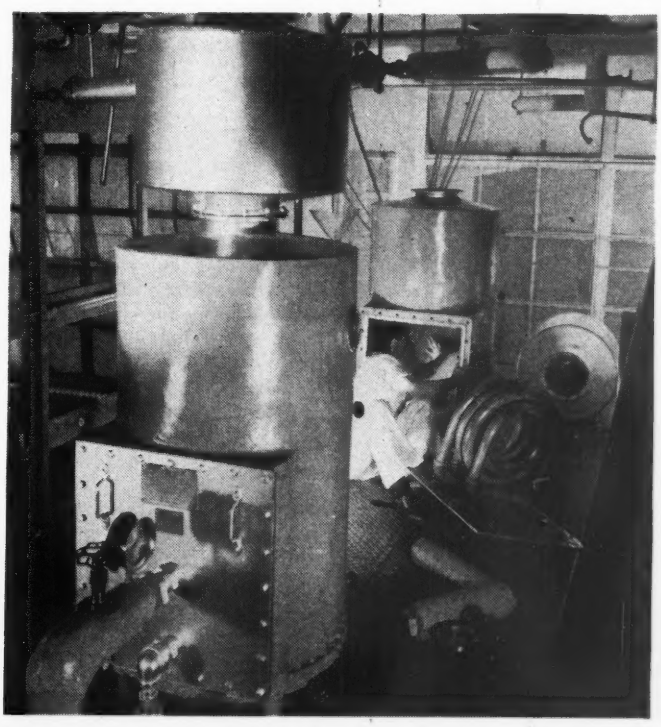
Pyrex sight glasses were installed on opposite sides of each evaporator. Illumination through one glass permits inspection through the other while the still is in operation.

All vapor column joints were flanged together. Flanged heads were specified for the condensers and coolers. Although these provisions mean more gaskets than in the case of solid construction, they facilitate inspection and cleaning. The gasketing specifications included tin covered rubber for the manhole, tin covered asbestos for the baffle and condenser joints, and sheet rubber for the condenser and cooler heads which come in contact with raw water only.

The various units of the still were constructed of heavily tinned copper or tinned brass, in accordance with standard practice. Distillate is led off through tin and glass lines, with a downward slope all the way.



This battery of three continuous-type stills delivers 2,500 gal. of high quality water in 12 hours.



Special features of construction and installation facilitate inspection and maintenance.

Minimum of Attention

When properly maintained, these stills can be operated with a minimum of attention. Steam supply and raw water feed are each controlled with two valves in series. One valve is used as a shut-off and the other is used as a throttle valve, set for the usual operating conditions. Constant steam pressure and constant water pressure are both desirable. Variations in water pressure are best corrected by taking raw water from a constant level supply tank on the roof or an upper floor. When there are variations in steam line pressure, a pressure regulator or reducer should be used for maintaining constant pressure on the heating coils. Insulating the evaporator will help to maintain constant operating conditions. Insulation is neither necessary nor desirable on the baffle unit, condenser or cooler.

The deconcentrator bleed cock should be inspected periodically, as scaling up will reduce the volume of bleed. The evaporators should be drained each time the stills are shut down. Distillate is drained from the condensers and from the coolers.

Each day the first run of water is discarded. It is desirable, when possible, to operate all of the stills daily; or in any event, to alternate them. Full capacity operation of each still should be the rule, as operation below capacity is wasteful and requires new valve settings. "Pushing" is to be avoided, however, as operation above rated capacity usually results in substandard water. Once steady operating conditions are established, it is possible for one man to operate the stills and to devote most of his time to other duties. Unattended operation, however, is not advisable.

Low Residue

Water quality has been maintained throughout. Residue on evaporation of distillate commonly runs 2 or 3 p.p.m. The single distillation eliminates all trace of chemically detectable organic impurities. There are certain organic impurities present in raw water which can be detected only by biological test. These are also eliminated when the stills are clean, free from leaks and correctly operated. The impurities of especial interest are of bacteriological origin, commonly known as "pyrogens" or fever-inducers. They may cause a fabrile reaction in patients if allowed to contaminate intravenous solutions. There is no known chemical test for them. Removal of these materials was the primary function of the battery of stills described. It was done successfully as long as all of the operating precautions were observed.

The distillate is odorless and tasteless, and essentially sterile when first collected. The pH of the fresh distillate is approximately 6.0, which is reduced as atmospheric carbon dioxide is absorbed. Special collecting and storing means are necessary for maintaining neutral pH, although ordinarily no practical purpose is served in doing so. The quality of the product is superior to that of a double or triple distilling outfit improperly operated or inadequately maintained. To further improve the quality of the water, it would probably be necessary to resort to the use of equipment and precautions as classically established for the preparation of "conductivity" water.

Conductivity Index

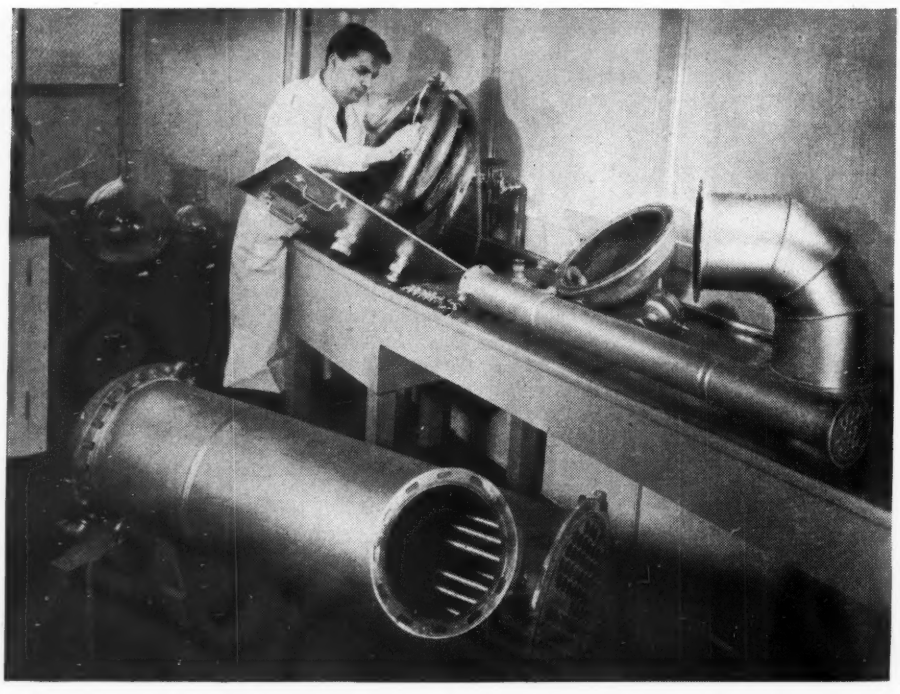
Electrical conductivity of fresh distillate has been used to some extent as an index of the effectiveness of a water distilling procedure. Conductivity measurements, which may now be made with a simplified type of Wheatstone bridge, give an indication of the quality of fresh distillate. Conductivities can, if necessary, be automatically and continuously recorded. For the purpose of preparing intravenous injections, however, the physiological test remains the most sensitive known index of freedom from organic impurity. Regardless of the purpose for which the distilled water is to be used, it is advisable to maintain regular control. Conductivity measurements may serve in many cases. Where a specific offending or interfering impurity is to be removed, however, there is no test so satisfying as a direct measurement of the impurity which has to be eliminated.

Maintenance Routine

The Barnstead battery described requires a minimum of maintenance. Each three months the manhole covers and heating coils are removed. The coils and the interiors of the evaporators are usually lightly scaled. The scale is removed by brushing with dilute hydrochloric acid. In the course of time, most of the tin is removed from the coils and the inside of the evaporators. These stills have been operated with copper thus exposed for many months without there being any detectable copper in the distillate. Baffle, condenser and cooler surfaces should remain well tinned indefinitely.

Each six months, the baffles, condensers and coolers are removed for inspection and testing. The baffles and vapor elbows are light and can be lifted off when unbolted. The coolers can be handled easily. For lowering the condensers, however, it is advisable to use tackle. For this purpose, eyes were installed in the ceiling of the still room, and corresponding eyes were placed in the

(*Turn to page* 230)



Scale is removed from the heating coil, shown in the rear, each three months. The condenser (front) is inspected each six months.

Frozen Foods Skyrocketed In Wartime Germany*

Wartime shortages of tinplate forced Germans to go all-out for frozen foods. Hundreds of plants were built and production was quadrupled in the first three years of war

GROWTH of the frozen foods industry in Germany, from 22,000 tons in 1940 to over 100,000 tons in 1944, was due, in a large part, to the necessity of finding a substitute for canned foods when tin became unobtainable. Taking over producing units owned by citizens of occupied countries furnished some of the necessary equipment and "know-how."

Prices of frozen foods were from 20 to 25 percent higher than canned foods, although the quality was not always superior. The young industry was having difficulties in the choice of raw materials, in freezing technic, and in packing. Undesirable flavors were produced in strawberries and stone fruits, and in asparagus, tomatoes, salsify and celery. Consideration was given to the cultivation of new varieties for freezing.

It is interesting to note that the two leading producers of frozen foods for the German market were: Solo Feinfrost G.m.b.H. and Nordsee Deutsche Hochseefischerei. Both of these companies belonged to the Dutch margarine concern, Unilever N. V., which was taken over in 1940 by the German Custodian of Enemy Property. Shortly before the war Unilever Ltd. obtained exclusive world rights to the Birds Eye freezing process and equipment outside of the United States. First foreign installations were made in Germany under the supervision of the Dutch division, Unilever, N. V. American technical knowledge of frozen foods had been supplied to the Germans before the outbreak of hostilities.

One other firm produced frozen foods on a large scale: Hochseefischerei Anderson & Co., in Hamburg. It was owned by the all-powerful Reemtsma cigarette concern, which acquired the firm as an outlet for its large liquid funds. Originally, operations were confined to the canning of fish. When the shortage of tinplate limited this operation, a change was made to the freezing of fish. Fruits and vegetables were included later.

A number of firms soon entered the frozen food business. In 1941, seeing the possibilities of the freezing process in the production of highly concentrated fruit juices, a director of the Braubank formed the Schneider & Company in Berlin. Shareholders were 15 leading breweries. It was planned to concentrate on business abroad.

In 1942 Josef Pankofer & Co., an ice cream manufacturer in Munich, and the Nuremberg Ice Cream Factory, Scholler & Co., formed a very active firm, the Nuremberg & Pankofer A. G., with a capital of five million marks. They were to manufacture concentrated citrus juices by a freezing process, and planned to erect 20 freezing plants abroad.

Another ice cream manufacturer to enter the frozen food field was Gronland Eiscreme G.m.b.H. of Dusseldorf, who formed the Gronland G.m.b.H.

In order to keep abreast of developments, the old-time preserving industry and the fisheries thought it advisable to collaborate with the new industry. Thus the Gefriertechnische Gesellschaft Deutscher Hochseefischereien, and a manufacturing firm, the Vereinigte Tiefkühlgesellschaft Lohmann & Co. A. G. were formed.

The "AHENA," Arbeitsgemeinschaft von Herstellern tiefgefrorener Nahrungsmittel G.m.b.H., came into being in Dusseldorf to produce frozen fruits, vegetables and fruit juices. The shareholders were said to be ten canneries, two refrigerating firms, a Rhenish wine firm, and the Erka Tiefkühlverfahren G.m.b.H. The "AHENA" was joined by two subsidiaries of Aschinger, the large restaurant firm in Berlin. They were Kühlund Gefrierhaus Vitam G.m.b.H. and the Dutch Winterzon-Conserven N.V., which had been started to produce frozen foods for the Aschinger restaurants.

Operations Outside of Germany

So much importance was attached to the opening of the foreign supply markets that representatives of the Army High Command, The Four-Year Plan Commission (Foodstuffs Group) and representatives of the private frozen foods industry met in 1941 to lay down a plan for zoning production. Northern Norway was reserved for fish, Holland and France for vegetables, and Italy and the Balkans for fruit.

Military and other official bodies interested themselves in forming a Deutsche Behälter-Verkehrs-Gesellschaft to provide refrigerated transportation and frozen lockers. A similar program was sponsored by the Kühldienst G.m.b.H. They were to close the gaps in the "Cooling Chain," i.e., distribution, from the producer via the trade to the ultimate consumer.

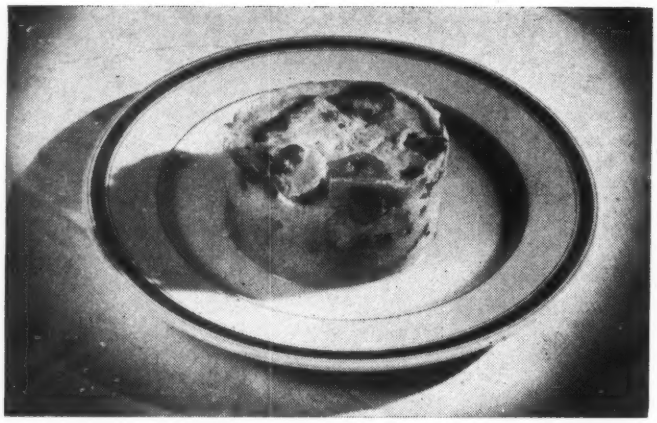
A freezing syndicate was formed by Andersen & Co., Solo Feinfrost and Pankofer to operate in France. It entered into a working agreement with a dozen leading canneries in France, at least six in Italy, one in Belgium and two in Bulgaria.

In Norway, the principal aim of the Nazi was to freeze as much fish as possible for the troops. Solo Feinfrost G.m.b.H., together with a subsidiary company, Frostfilet A. G., established itself in Norway. In 1940 the Nazi press stated that "the largest deep-freezing plant in Europe" for fish fillets "was being established in Trondheim."

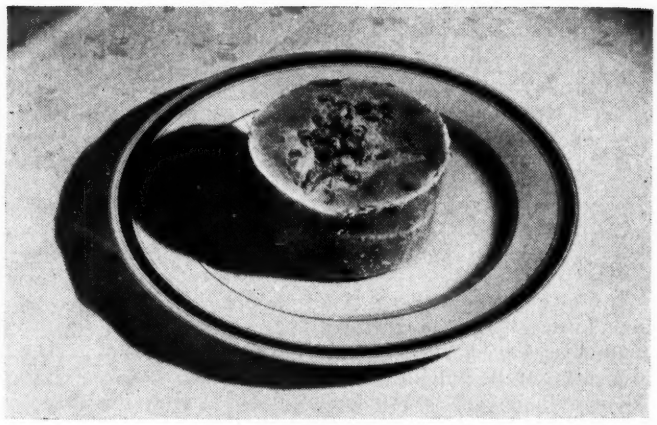
Many freezing plants were built in Hungary. In Warsaw, the first freezing plant was finished in 1943.

Bulgaria, spurred by German initiative, made great strides in the frozen foods industry. Of the 95 large freezing plants, 56, representing an investment of about 450 million Lewa, were financed largely by private enterprise, 36 by municipal authorities, and three were state-owned. Freezing of meat for domestic consumption was considered, but the freezing of vegetables, fruits and fruit pulp was pushed, mainly for the German market.

*From an article published in "Die Zeitung," by anonymous refugees.



Frozen lamb stew.



Frozen chicken a la king.

QUALITY CONTROL

Of Precooked Frozen Foods*

Storage keeping quality tests are important before plunging into quantity production. Over 40 cooked foods now commercially frozen. Dangers of bacterial contamination highest during period of cooling and packaging

By BARBARA L. HUTCHINGS and CLIFFORD F. EVERS
The Birds Eye-Snider Laboratories, New York

OUT of the wartime era of merchandising have come many new, quick frozen products with particular interest being evidenced on the part of producer and consumer in precooked frozen foods. Precooked foods are not altogether new to the industry because some have been on the market for more than fifteen years. However, the number of products has greatly increased in the past two years and many more are in the stage of technical development.

Precooked frozen foods are no longer the fantasy of research departments, for in 1942 the first volume pack of cooked frozen foods began. This production started when the necessary ingredients were difficult to secure and often were of questionable quality. There had been very little advertising to prepare the public for their sale and there had been hardly any technical or experimental work done on these products. Many of the items failed to please the public and left the frozen food men skeptical about the future of cooked food.

While early failures provided the warning signals for over-eager producers of the future, they did not destroy the idea that under proper conditions of production and marketing, frozen cooked foods are practical. Now in 1945, there are over 22 food processors packing a sizeable quantity of these items. The list of new products includes over 40 different ready-to-serve foods. Many packers look forward to this new field to provide the opportunity of maintaining year-round plant operation. All have high hopes and confidence for the future development of new markets. However, older production men are urging that caution be exercised and a great deal of research be undertaken before swinging into full production on a large scale. Their caution is justified since the problems of freezing precooked foods of good quality are numerous and varied.

Any cooked food can be frozen, but with what degree of success this can be done depends on many factors. Most technologists in the field will agree that any product should receive a twelve-month storage test period without showing marked deterioration in the quality of flavor, texture or color. Then and only then, can it be considered a good production risk.

Several processors have forged ahead in the production of precooked foods without sufficient investigation of processes or without making suitable storage tests. Regrettably, much of the experimental work already carried out has been based on limited storage tests of from two to four months duration. This gives, in many cases, a false picture of the problems which may confront a packer.

Since 1935, soups, meats, meat substitutes, poultry, fish items and

*Presented at the 41st Annual Meeting of The American Society of Refrigerating Engineers, New York City, December 10-12, 1945.

bakery products of all kinds have been quick frozen and distributed to the institutional trade. In late years, the retail trade has been consuming such items as Boston baked beans, chicken a la king, chile con carne, spaghetti in tomato sauce, pumpkin pie mix, and in recent months, such items as frozen fruit pies, shortcakes, fruit salads, muffins, biscuits, cakes and cookies, oyster stews, creamed tuna and salmon, as well as many other specialty items.

Unfortunately for the trade, not all of these items have been quality products. Time may prove that too eager production, along with too little preparation and understanding of the problems besetting this new industry will leave its mark on consumer acceptance of the products. However, individual successes, in packing specialty items of superior quality, lead enterprisers to view the field with interest.

Because cooked foods are the newest entrants into the frozen food industry, there are no established standards of quality. It should be one of the first concerns of all packers to have these standards set as high, if not higher, than those required for the production of fresh frozen products. Secondly, they should see to it that these requirements are enforced for their own protection as well as that of the consumer.

A quality product never "just happens." It is the result of careful planning and the continuous checking of raw materials, production methods, packaging procedure, and freezing technics. Quality control, not quantity control, is the surest if not the quickest way to economic stability for any packer. Rightly instituted and correctly followed, quality control methods do pay dividends.

The Factors Involved in Quality Control

True control of quality accepts the responsibility for and the regulation of plant sanitation, surveillance of the health and cleanliness of personnel, selection of top quality raw materials, adequate sorting, washing and trimming of the raw materials, correct temperatures and timing of processing, proper packaging materials and methods, and last, but not least, correct freezing technics and storage. The neglect of any one of these factors, can notably lower the final quality of the pack.

Sanitation within any freezing plant is not simply a matter of keeping it neat and clean in appearance. It should be considered from a bacteriological viewpoint. This is especially true in the case of precooked frozen foods for they may be more susceptible to contamination and spoilage from bacteria growth since they are already partially broken down through cooking processes. Any production of these items on a commercial scale should be attended by strict observance of sanitary methods and a continual check on bacterial counts. It is a prime requisite that all these products be handled as quickly and as aseptically as possible to forestall contamination during periods of cooling and packaging, since it is at these stages in production that there exists the optimum temperatures for more active bacterial growth. A packer must insure the product by every means at his disposal in order that it will stand up under storage and marketing conditions.

Preventing Contamination

The problem of preventing the contamination of cooked frozen foods by micro-organisms is a serious one, related directly to public health. Some experimental work on this particular problem has been carried out, and a great deal more is being planned both by government and industrial laboratories. The results of some of the earliest experiments carried out in our own laboratory show that most cooked foods prepared under normal sanitary plant conditions give much lower bacterial counts than the average counts of corresponding fresh frozen products. This, however, is only half of the picture. Further experimentation with inoculated cultures of precooked foods will most likely show that they are excellent media for bacterial growth once contamination has taken place. Plate counts for products containing fish and shellfish have already indicated that they could easily become trouble makers and the presence of *Staphylococcus aureus* has been noted in some of these products prepared on a laboratory scale under rigid sanitary conditions.

Most frozen cooked foods will receive less cooking than the normal cooking procedures because of the additional effect of the freezing process on the cell structure of the ingredients. This shorter cooking time will not yield a sterile product and the failure to cool the product rapidly will increase the danger of spoilage.

Unsanitary packaging equipment or procedures also offer an open door to spoilage bacteria. The maintenance of sanitary conditions is not an impossibility. It requires technical guidance and the continual enforcement of a few correct methods of cleanliness, but it prevents the high cost of loss through spoilage or the fear of entanglement in legal disputes over the food poisoning of consumers.

The length of time a cooked food can be held after it is removed from freezing storage is also of special significance. Extensive bacterial examination of pork and beans as re-

Frozen chicken a la king after thawing.

corded by the Western Region Research Laboratory reported that experimental samples after being held for 18 days at 40 deg. F. showed no significant growth of bacteria. This was also noted in a sample held for one day at room temperature. However, the counts showed marked increase by the second day at room temperature and on the twenty-first day at 40 deg. F. This does not necessarily indicate that commercially packed foods will give similar results. This same laboratory reported a very high count of at least one-half million on a sample of frozen pork and beans packed in tomato sauce which was purchased in the local market. Admittedly, any cooked foods whether frozen, canned, or home cooked are subject to change once they are exposed to normal temperatures and conditions but it becomes a matter of particular consumer education to assure proper handling of precooked foods.

The responsibility of the retailer in preventing the spoilage of these products by bacteria organism cannot be overlooked or overemphasized. Improper handling that permits products to become thawed and then refrozen after they have once defrosted is a direct approach to the encouragement of bacterial growth. Products which undergo such treatment in marketing cannot reach the consumer as quality items, and may even lead to cases of food poisoning. *Closteridium botulinum*, the organism responsible for the deadly botulinus, and *Staphylococcus aureus*, the cause of the condition so often misinterpreted as ptomaine poisoning, may be present in foods without causing any gastro-intestinal disturbances if the opportunity for the development of toxins has not existed. The defrosting, refreezing and redefrosting of these products may present the opportunity for the production of the toxins. The organisms responsible for such gastro-intestinal diseases as typhoid, paratyphoid and dysentery cannot be present in foods at all if the health of the consumer is not to be endangered. This is more important in the cases where a product receives little or no reheating before serving.

The Development of Standard Products

The development of formulas which will yield standard, uniform products of superior flavor, texture and color, and possessing good keeping qualities is another serious problem. It is in the experimental kitchen that these standards can be weighed and measured and finally accepted or rejected. The accepted standards should then be used as a continual check on all future production.

This is a field wide open for experimentation. The fact that a small batch, or family size recipe, yields a superior product is no guarantee that the same product, without adaptations, will yield an equally superior product when produced in quantity or under commercial conditions. The development and use of a pilot plant for the preparation of larger batches, using miniature commercial equipment will allow the technologist to anticipate and correct in advance the problems which might arise during a pack within the plant. It is in the pilot plant that the need for new types of equipment may be realized and experimented with. Older types of equipment may be adapted to the newer needs and short cuts or revisions in formulas can be made without great loss of time, equipment or money for the producer.

To solve any or all of the problems of producing ready-to-serve frozen foods, the chemist, bacteriologist, cook, mechanical engineer, packaging expert and plant manager must all work together.

Unsolved Problems

Here are a few of the problems yet to be satisfactorily solved for the trade: the advisability of producing baked rather than unbaked pastry products, the use of various types of seasonings, the correct cooking procedure to insure standard textures and flavors, the development of these standards and the practical means of measuring them. The causes and prevention of denaturization of proteins, the use of colloidal chemistry as applied to food chemistry, the use of antioxidants, of gums, of glazes, of the various types of stabilizers, the advantages and disadvantages of certain types of flours, leavening agents, fats and oils, all of these are still question marks in the work books of the chemist and cook.

Some of the work already instigated tends to suggest that baked frozen products are superior in keeping qualities to unbaked frozen products of the same type and grade. Seasonings present a difficult problem. Certain flavorings and spices tend to "shrink" or completely disappear after freezing and prolonged storage, yet others will "grow" and unpleasantly predominate all other flavors after a given time. The use of oils of spices, rather than dry spices, may make the matter of controlling these variables much easier. One thing is certain—standards, and the means to maintain these standards, must be developed to insure a uniform flavor product at all times.

The texture of precooked frozen foods is dependent on several factors. Some of these factors are the natural texture of the food itself, the combination of one or more raw materials and the effect of cooking upon the natural textures of these ingredients. Finally, there is the effect of freezing. Many completely cooked products, having been frozen, defrosted and reheated, yield a product mushy and unattractive in color and appearance. Some products need only partial cooking, for the freezing process will have the same effect as heat and will expand the cell structure of the food. Because of this, cooking times and temperatures must be carefully calculated for a batch of any given quantity. Shellfish such as lobsters, crabs and shrimp tend to toughen after cooking and freezing.

The prevention of off-flavors, due to rancidity of fat in various products, has been retarded and in some instances entirely prevented through the use of anti-oxidants.

Sauces and gravies offer their own particular problems. Not only are they high in fat content and susceptible to rancidity, but they tend to separate and weep, or to curdle and lump, after defrosting and reheating. Nearly all foods exist in colloidal form. Their behavior in batters and doughs, in sauces and soups, gravies and stews, depends upon their colloidal characteristics. The adaptation of colloidal chemistry to the proper procedures of food preparation and the freezing process is an essential part of the experimental work yet to be accomplished in the kitchen and laboratory.

The quality of such foods as frozen aspics, frozen cakes and pies, sauces and soups may depend upon their stability as colloids and their ability to hold the water phase. It is possible to make a colloid more or less stable by controlling the pH value of the colloid. This calls for extensive research on individual products. The use of a colloid mill is a mechanical means of dispersing one colloidal phase in another, but it does not answer all of the problems of preventing separation or weeping. The use and stabilization of such emulsifying agents as gelatine, gum tragacanth, casein, gelatinized starch, yeast, agar-agar and Irish moss, may prove to be of even greater value to the cooked food program.

Frozen lamb stew after thawing.

The color and attractiveness of a finished product will be influenced by the selection of raw materials of good quality and correct maturity. Over-mature vegetables will be greyed in appearance and overcooking will spoil the appearance of even strictly fresh produce. The mineral content of the cooking water may influence not only the color but the texture of the finished product. Correct sorting, trimming, washing, the size and type of cutting, slicing or dicing of the raw materials may enhance or detract from the quality of the packaged items.

These are a few of the problems which will need a great deal of experimentation before precooked foods can establish themselves firmly in the field. There are many more, including the control of viscosity, moisture content, the development of off-flavors other than rancidity, correct packaging, proper defrosting and reheating methods. The solving of these problems offers the technologist an opportunity to serve his company and the frozen food industry. The step from the research laboratory into actual production is only a very short one. The two departments will benefit themselves and each other by mutual cooperation.

The Production of Precooked Frozen Foods

The production problems encountered in the preparation of ready-to-serve frozen foods are very similar to the problems encountered in the canning of a corresponding product. Straight line production will facilitate the most economical use of equipment, labor and raw materials. It will also make it easier for the packers to see and correct any faulty or incorrect procedures. Sanitation is a much simpler problem where equipment is arranged in a straight orderly fashion.

The correct choice of equipment, keeping it to a minimum, will help keep costs low, lessen the danger of accidents, decrease the possibility of contamination and make for more efficient production. In general, it will be more advantageous to put all the ingredients of a batch into one kettle rather than to cook and then combine one or more ingredients for a finished product. In the production of chowders, stews and similar products, this is entirely plausible. The preparation of cakes, pastry, doughs and cookies lends itself easily to this one-kettle method. Some specialty items will demand more complex methods of preparation, but all foods should receive as little handling as possible.

Responsibility must be delegated, for too many cooks can spoil the broth. One person should check the weights and measurements of all raw materials going into a kettle. This should be his only responsibility. Another person should control all cooking times and temperatures and check cooling temperatures since under- or over-cooking will ruin costly raw materials, and improper cooling may cause spoilage.

The packaging problems facing the production men are acute. Viscous, fatty, rich foods demand special equipment and packaging materials. The standard 12-oz. frozen food package just won't do. Pies and cakes, pastry doughs and cookies, offer a problem in the size and shape of containers. For all of these products which are high in fat content, the packaging materials must be grease-proof as well as vapor-proof. Oxidation and freezer burn are just as great, if not greater, enemies of cooked frozen foods as they have been of fresh frozen items.

There is much to be done in this field and the makers of packaging materials are already developing new materials on the basis of earlier experimentation with cooked foods, but they are waiting for definite specifications of needs to be formulated by the frozen food industry. Some of the newer types of containers which have been developed have a laminated aluminum foil lining in which the food can be defrosted and reheated for service without the development of metallic off-flavors. This type of container has been fashioned into a package to facilitate the packaging of a complete meal in one unit. This makes frozen cooked foods practical for air-line service, railroad diners, quick service restaurants and even for the housewife for special occasions or emergencies.

For the standard waxed paperboard, 1-lb. box, there are waxed paper bags which have laminated cellophane liners. These are particularly adapted to the use of sauces and products which have a penetration of fat during storage.

Other Fields of Study

Aside from research dealing with the initial problems of cooking procedures and packaging techniques, there are other fields open for experimentation. It is no idle dream that the future will hold a completely automatic packaging line. The development of mechanical engineering research will prove itself an essential part of the industry, for it is the invention of more efficient equipment that makes substantial savings in the production budget.

The future of frozen cooked foods will depend upon the industry itself. If it will pack quality products at reasonable prices for the consumer, the buying public will be glad to accept such labor and time saving products.

References

1. Anon, How to Cook Food for Quick Freezing, *Food Industries*, vol. 15, 69, 110, October, 1943.
2. Anon, Frozen Cooked and Eaten in the Package, *Modern Packaging*, vol. 18, 102, 103, June, 1945.
3. K. T. Osterlang, Precooked Frozen Fish Preparations, *Food Packer*, vol. 26, 42-44, August, 1945.
6. F. W. Williams, What Is the Future for Cooked Foods? *Quick Frozen Foods*, vol. 7, 43, 59, July, 1945.

Planning for Clean Flavor

Can you always depend on your sense of smell? Here are 13 reports on causes of off-odors in foods and simple methods for curing the problem. All solutions required simple, inexpensive, commonsense application.

BY J. A. DUNN, Technical Director
Diamond Crystal Salt Co., Inc., St. Clair, Michigan

FOOD MANUFACTURERS would do well to bear in mind the factor of fresh, clean, attractive flavor—the type of flavor that brings repeat business. Not only is this essential at the time the foods are produced, but this flavor must persist undiminished and uncontaminated until the last of the product has been consumed.

Many foodstuffs pick up odors and flavors during storage in warehouses where ventilation is not the best. Flavors and odors, for the most part, are soluble in fats and also in water. Raw materials that contain even small amounts of finely divided fat, such as flour, coconut, nuts, cocoa, and similar items, possess the ability to pick up odors and flavors quite readily. Even materials like salt, sugar, and starchy products will pick them up under adverse conditions of storage.

Any baker can prove this statement quite simply. Bake two pie shells. As soon as they are cool, wrap and seal one of them in moisture-proof cellophane. Leave the other pastry shell exposed, either in the refrigerator or in any room in the plant. Let it remain for a week or two. Then take the unwrapped and exposed sample, together with the wrapped sample, away from the plant and wait until your sense of smell gets back to normal. This may require several hours. Open the sealed package and compare the taste and odor of the wrapped pie shell with the unwrapped pie shell that has been exposed to the odors in your plant. The comparison will likely show that the unwrapped package has picked up off-odors. This simple experiment brings home in striking fashion, the need for adequate ventilation in any plant where commercial food products are produced.

I have indicated that the two pastry shells should be tasted and smelled away from the plant. The reason for this is that our sense of smell becomes fatigued after long exposure to an odorous condition and, after a while, we are not conscious of the odors that surround us. It is only some time after being in fresh air, away from the plant, that it comes back to normal so that slight odors and flavor contaminations may be recognized. Food products are therefore best examined for flavor and odor away from the plant in which they are produced. It is a good plan to take home samples of various products, particularly over the weekend. Open and examine them after you have been away from the plant for a full day. Serve them with your meals. Many worthwhile discoveries will be made in this way.

It has been shown experimentally, and on the practical level as well, that foods pick up off-odors in an accumulative or progressive way. Even when the air in the shop smells relatively clean, there are faint traces of off-odors that are so diluted that the nose is not conscious of them. Foodstuffs, however, pick up these off-odors even though they are in a very dilute condition and when foods are stored in such an atmosphere day after day, sometimes for a period of several months, they continue to absorb these faint traces of odors until the net result is that they have picked up enough odors so that the flavor is affected. Thus, it is essential that foodstuffs, particularly those containing various amounts of fatty constituents, should be stored in a warehouse, well ventilated and filled with fresh, clean air. Wherever possible, foodstuffs should be kept covered if packed in containers.

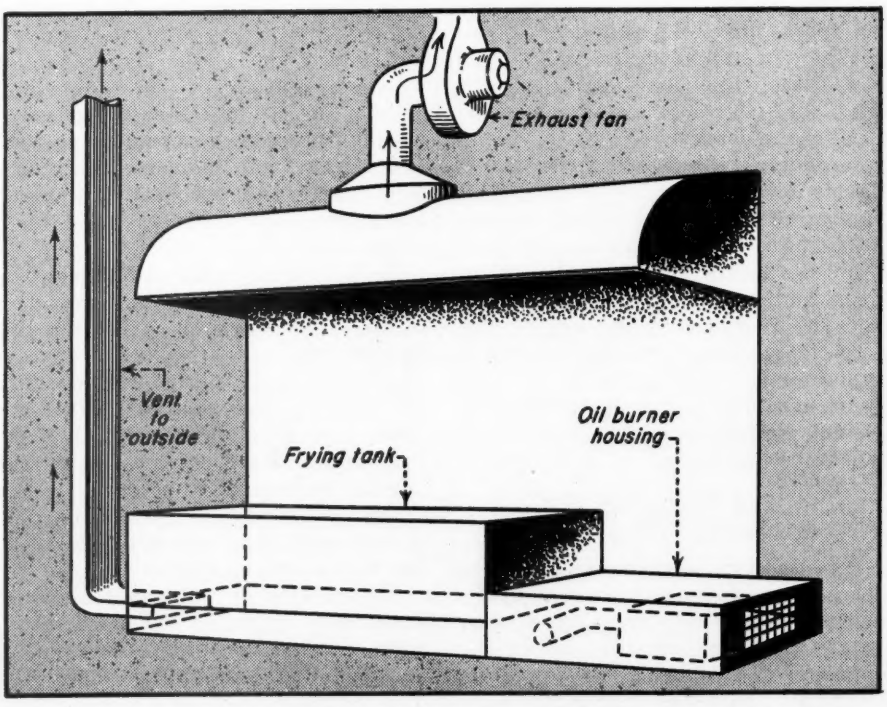


FIG. 1. Fuel oil fumes are prevented from contaminating the plant products by housing the oil burner in a removable ventilated transite box.

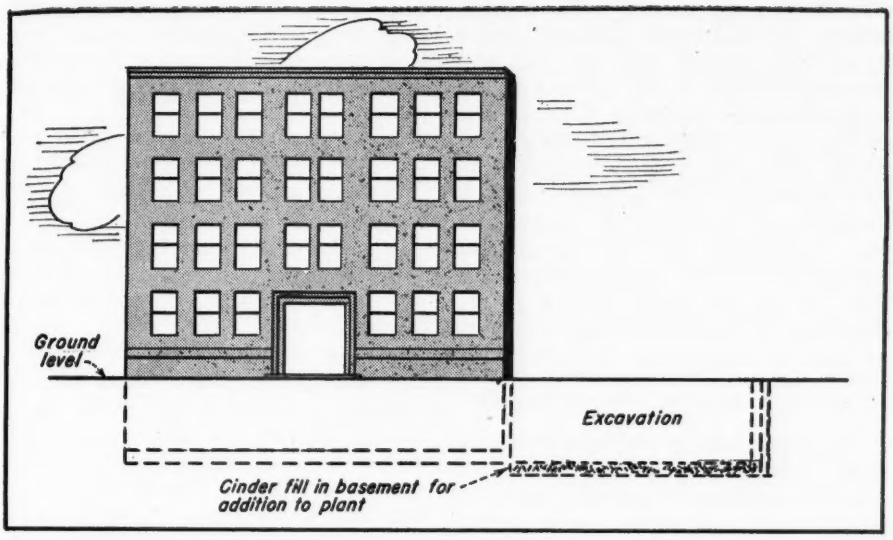


FIG. 2. A fill, in the excavation for a plant addition, was made with gas house cinders. When wet, they produced a gassy smell that permeated the plant and gave the foods an off-odor.

Attractive appearance will help to make the first sale. After that, it is flavor and real eating enjoyment that will bring repeat business. The baking industry has been very successful in capturing the bread market. Unquestionably, one reason for this remarkable success is the laborious time-consuming nature of bread baking. When it comes to cookies, cakes, pies, and other sweet goods, however, it is a different story. It has been estimated that less than half of the sweet-baked goods consumed in this country is commercially baked. Here, then, is a most fruitful field for postwar expansion.

Why has it been more difficult to sell the American housewife on sweet-baked goods and desserts? One factor, I believe, is that sweet goods tend to occupy a more important place in the meal than bread which is taken as a matter of course and is seldom eaten without some other food. Bread is usually spread with butter and, frequently, accompanied with peanut butter, jam, or other spreads, or it is served in the form of sandwiches or toast. On the other hand, sweet items are frequently served by themselves as a dessert or as the *pièce de resistance* at a party or an afternoon tea. Because of this, the hostess is inclined to be more demanding about the eating quality and flavor of such foods.

The problem of satisfying the customer depends, therefore, to a great degree on the ability to manufacture food products with a fresh, clean, attractive flavor. How can fresh, clean food products be produced if the raw materials have been stored under adverse conditions and have been allowed to pick up off-odors and flavors? How can fresh flavor be preserved, uncontaminated, when foods are prepared under poor ventilating conditions—where they are allowed to cool in a room filled with a dozen different food odors? Moisture-proof packages accentuate this problem because they tend to hold in these volatile off-odors.

Off-flavor in a Cake

Several years ago a problem appeared in the form of a bar cake with a chocolate icing. When this item was first produced, it had a most attractive flavor. The bar cake was wrapped in moisture-proof cellophane and sealed affording protection while en route to the consumer. After 24 hours, however, when the package was opened and the air inside of the package was smelled, a definite off-odor was observed. This tended to depart somewhat after the cake had been unwrapped. The very fact that the off-odor was present inside the package was positive proof, however, that the cake itself contained this off-odor. Subsequently, the problem was solved when it was learned that the chocolate liquor used in the icing was at fault. A fresh supply of chocolate eliminated the problem.

Frying Odors in Potato Chips

Purchase a package of potato chips and when you open the cellophane envelope, smell the air inside the package. If ventilating conditions in the plant producing the chips are satisfactory, the air inside the bag will smell clean, but if you detect a distinct off-odor, you may be sure that something ought to be done about ventilation in the chip plant. An item like potato chips or salted nuts, because of the high-fat content and the large amount of surface on the product, will pick up off-odors very readily. Progressive chip manufacturers recognize this fact and are doing something about it. It is mainly a problem of adequate exhaust fans and stacks to remove the frying odors from the plant effectively.

Fuel Oil Flavor Prevention

In checking an odor complaint in a potato chip plant, it was observed that the chips possessed an off-flavor resembling fuel-oil fumes. A faulty oil burner was found to be the cause of this. The solution proved quite simple. By installing transite partitions around the oil burner, enclosing it in a small room with ventilation provided from the outside, the fumes were prevented from contaminating the finished chips as they were cooling—just a matter of common sense ventilation. (See Fig. 1).

A Gas House Flavor!

On another occasion, complaints were received by a bakery regarding an off-flavor in their products. This was traced to the use of gas house cinders that had been used for a fill-in before an addition to the plant was made. (See Fig. 2.) Whenever the weather was damp, the odor of these gas house cinders was quite prevalent in the neighborhood and the raw materials picked up enough of this off-odor so that the flavor of the finished items was adversely affected.

Purchases Too Large

Another source of trouble arises from the desire to keep raw material costs at an absolute minimum. In purchasing material such as dry milk, for example, it is a mistake to purchase too much at one time. It is also a mistake to purchase such products in containers so large that too long a time is required to use up the product. When air can get to a product like milk powder, the delicate fresh flavor is adversely affected, particularly when the product is exposed to the air for prolonged periods of time. It is better in a case like this to pay a little more for smaller packages and to buy more frequently, thus insuring a fresh supply at all times. This is also true of products that are used in rela-

tively small amounts, such as nuts, coconut, cornstarch, tapioca, etc.

One Ingredient Lacked Something

Bearing in mind that we are competing with home preparation of sweet-baked goods and desserts, it follows as a matter of course that the raw materials used must be fully equivalent, if not superior, in quality to those used in the home. Here is an illustration of how this factor operates. In working with the production manager of a large bakery organization on the development of fruit-cake, one formula was finally selected as the right one. The cost was reasonable. The keeping-quality and slicing properties were good. The appearance was excellent and the ability to hold up over a long storage period was proved. Provided with the complete formula and procedure, the bakery superintendent made his first runs. The resulting cake was scored, using the research-bakery cake as a control. Something was definitely lacking. By process of elimination, it was learned that the bakery was not using a molasses with the same appetizing flavor as that which had been used in the experimental runs. By paying slightly more for the molasses, the bakery superintendent was able to turn out, on a commercial basis, a fruit cake that compared very favorably with the experimental cake and that proved to be a very popular item. By being insistent about the matter of fresh, attractive flavor, this bakery superintendent was successful in introducing fruit cake to his market.

Peanut Butter Had Fruity Odor

Returning again to the question of ventilation, here is another example of flavor contamination that was easily and inexpensively eliminated. In a food manufacturing plant, complaints were received on an off-odor in peanut butter that was packed in glass. It was difficult to determine what type of odor had contaminated the product. Finally, the peanut butter was mixed with boiling water and by heating the mixture and smelling the steam it was apparent that the odor was fruity in nature. After securing this information, it was easy to locate the source of trouble. Across the corridor from the peanut butter department was the department for making up gelatine desserts with assorted fruit flavors. Because the doors into the two departments were open most of the time, the very strong, pungent flavors used in the gelatine section drifted across into the peanut butter section where the nuts were ground, where bags of peanuts were stored, and where exposure of the product to the contaminated atmosphere could not be avoided. The installation of a powerful exhaust fan and stack in the window of the gelatine dessert department insured that the drift of air at all times was into the gelatine department, out through the stack and up to the roof. (See Fig. 3.) This was a simple but most effective means of eliminating the difficulty.

Spice Flavor in Wrong Foods

In every bakery, odors are prevalent around the oven. It is practically impossible to prevent them. If spice cakes are being baked, while in another corner of the bakery bland-flavored, cream icing, marshmallow or whipped cream is being mixed, we may anticipate that the air beaten into these products will be contaminated with the odor of spices. A spicy odor is a most attractive one when it is in the right place, but no one appreciates a spice odor in a cream icing, in marshmallow, or in whipped cream. Dirt has been defined as "matter which is out of place" and, in a similar vein, off-odors may be defined as "perfectly good, attractive odors and flavors that are out of place." It is up to the food manufacturer to make sure, by adequate ventilation or by isolation of departments, that odors from one product are not carried over into another.

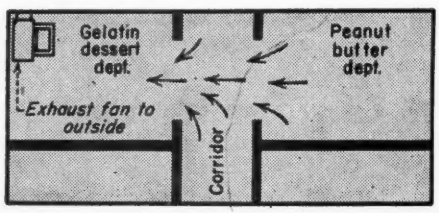


FIG. 3. Plan of plant to show new air-flow necessary to keep strong flavors and odors in gelatin dessert department from contaminating foods in other departments.

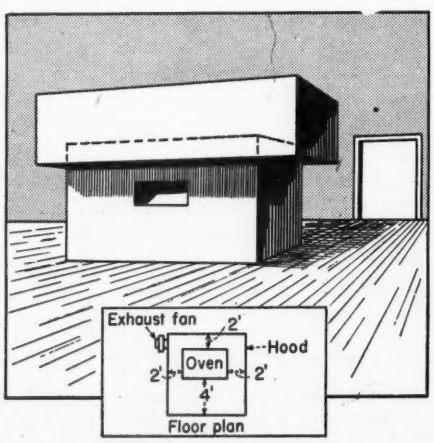


FIG. 4. To keep oven fumes out of the plant a fume hood with an exhaust fan proved to be a paying investment. It also reduced painting and cleaning costs.

Oven Odors Belong Outside

In one bakery, I have seen a very simple and inexpensive solution to the problem of removing oven odors from the plant. A partition extending from the ceiling to approximately one or two feet below the top of the oven was installed. A powerful exhaust fan and stack was also installed to remove the oven odors rising into this hood. As a result, oven odors were effectively removed from the bakery. The flavor of various items produced in the bakery was definitely improved. Every baker knows that the fumes from an oven will discolor the paint on the ceiling and walls, and if allowed to travel throughout the bakery, invariably lead to the necessity of frequent wash and paint jobs. This naturally adds to the expense of plant maintenance. It was found that by confining the oven fumes to a small space through the construction of the hood and by removing these oven fumes from the bakery with the blower and stack, a considerable saving resulted in the cost of washing and painting. The construction cost, therefore, paid for itself. (See Fig. 4.) It is necessary to wash and paint the walls and ceilings inside the hood frequently, but the rest of the bakery requires washing and painting at lesser intervals. Literally speaking, the improvement in flavor of the complete line of baked goods was accomplished without cost.

Use Clean Air in Store Rooms

Exhaust fans may be used to good advantage in raw material warehouses. It is not difficult to control the passage of air in one direction or another. If the air in the rest of the plant is contaminated with odors, it should not be drawn through the warehouse, giving the odors a chance to contaminate the raw materials that are held in storage. Fresh air should be drawn in from outside the plant and the draft thus caused to flow in the opposite direction. This tends to keep the odors out of the raw material storage rooms.

Refrigerator—Old Offender

Another common source of odor contamination is the refrigerator. Because of the very nature of the cold room, ventilation is difficult. Re-

(*Turn to page* 224)

"ORANGE JUICE"—Words
ORANGE JUICE—The Thing

Why current standards for concentrated orange juice don't tell the whole story. The Brix reading of a concentrate does not reveal the strength of the fresh orange juice. This is important to potential users

By BERNARD C. BAUM, New York

THE words "orange juice" are not the same thing as orange juice that is utilized by the consumer and food processor. If this sounds childish, perform this experiment: write the words "orange juice" on a piece of paper. (Go ahead, do it—don't just merely read.) Now try to drink those words. No "taste," "flavor," in fact "no nothing"—just words. Thus, the words "orange juice" are not orange juice itself.

So what!! . . . I believe that the public, manufacturer, and government act *as though* the words "orange juice" are one and the same thing as the product itself. We are acting, talking, writing, and using the words "orange juice" in a manner which, being false to fact, (or, more correctly — inadequate) has led us into difficulties and will continue to create future problems.

If the words are not things, then it follows that the words only symbolize things. Thus the words "orange juice" symbolize the thing, "orange juice."

But is there such a standardized thing as "orange juice?" In the strict sense—no. There is only the orange juice being drunk by Mr. Jones this morning, or used by beverage manufacturer Smith this afternoon, or manufactured by processor Williams today. Each one of these "orange juices" are different from one another.

There is not an absolute thing "orange juice;" nor absolute words —"orange juice." If the words "orange juice" must symbolize some variable thing, orange juice, then let us use a flexible and variable symbolization.

How can we employ this changed attitude; and, more important, what difference does it make to those who use "orange juice?" I suggest the following:

1. Be conscious at all times that the words "orange juice" have no one general meaning. The words "orange juice" have a meaning only within a given context.

2. Do the same thing with "orange juice" that you used to do with "X" in algebra. *Index* it, or *qualify* it in the following manner:

Orange Juice, Florida Canned, Grade A, or Orange Juice, California Fresh, 12 deg. Brix. By indexing or qualifying, you can adapt the words "orange juice" to any given context or meaning. Bear in mind that "orange juice" can vary in the following ways:

Variations in Orange Juice

1. **Place of origin:** (a) California, (b) Florida, (c) Texas, (d) others.
2. **Form:** (a) fresh, (b) frozen, (c) canned, (d) powdered, (e) concentrated, (f) bulk, preserved, (g) other forms.
3. **Method used in obtaining from fruit:** (a) hand burred, (b) machine burred, (c) machine pressed, (d) others.
4. **Soluble solids:** From 8 deg. Brix, 9 deg. Brix, 10 deg. Brix . . . 14 deg. Brix, with varying degrees: higher, lower and in between.
5. **Variety:** (a) Valencia, (b) Navel, (c) others.
6. **Color.**
7. **Taste.**
8. **Flavor.**
9. **Acidity.**
10. **Oil content.**
11. **Other factors.**

TABLE I—Approximate Equivalents

Fresh Orange Juice, Gallons	Strength of Fresh Juice Deg. Brix	Yield, Gal., Concentrate 65 Deg. Brix
9.2	9	1
8.2	10	1
7.4	11	1
6.8	12	1
6.3	13	1
5.8	14	1

Do not assume that "Orange Juice" means the same thing to whomever the words are addressed. Be conscious of the fact that the words "orange juice" are not the thing.

Difficulty Lies in Variable Raw Materials

What difference does it make if we adopt this attitude? The government has promulgated standards for Canned and Concentrated "Orange Juice." In the matter of Brix (soluble solids content) alone, there is a conflict in the standards. In the case of canned juice, the standard for Grade A is a minimum of 10.5 deg. Brix; whereas in the standard for concentrated orange juice, the specification tells you to bring the concentrate back to straight juice of 11.5 deg. Brix when testing it. Why this difference?

Standards are set for a matter of convenience and reference, and cannot say all or cover the whole subject of "orange juice." But the mere fact that standards are set is a step in the right direction.

However, there is a current controversy over the standards for still and carbonated "orange" drinks in the various states. None of these standards has taken into account the foregoing attitude toward the words "orange juice." Some states say an "Orangeade" should consist of 15 percent *orange juice* (the italics are mine) in the finished drink. Just how are they using those words? Do they mean "Orange Juice" 9 deg. Brix or do they mean "Orange Juice" 14 deg. Brix?

Have you any idea of the difference this makes to an orangeade manufacturer? Here is an example. Manufacturer A is in the business of

(*Turn to page* 218)

Damage by Freezing To Canned Meat Products Containing Carbohydrates

By BERTRAM W. GARDNER, JR., Meat Products Branch,
Quartermaster Subsistence Research and Development Laboratory, Chicago, Ill.

Low temperature storage and simulated winter shipping studies show that starchy components make canned meat products susceptible to damage by freezing. The product —not the container—suffers when such foods are frozen

IN the storing and handling of canned meat products, extreme cold and varying temperature conditions are often faced. They are conditions which should be taken into account during peacetime operations. Under wartime conditions they are a menacing threat to a subsistence program for the Armed Forces regardless of whether they are engaged in domestic or foreign service. For that reason, the Q.M.C. Subsistence Research and Development Laboratory has made a study of the effect of freezing, thawing and other changeable temperature conditions upon canned meat products, which were components in rations for the Armed Forces during World War II.

The study was carried out under conditions which would likely be the extreme of those to which the products would be subjected under actual operating conditions. One portion of the study was carried out under conditions which would assure alternate freezing and thawing of the products under test. The second portion of the study was carried out under conditions which would simulate winter shipping conditions in the United States when standard railroad freight cars are used. The second portion of the study also took into account loading or stacking technic in which one part of a shipment might serve as an "insulation" or protection for other parts of the shipment.

In its essentials the first part of the study was carried out as follows: Run-of-pack samples of the canned meat products were obtained from 75 different manufacturers and stored for four months at room temperature (70 to 80 deg. F.) to assure freedom from spoilage due to inadequate processing. At the end of that storage period they were transferred to –30 deg. F. storage for 24 hours to obtain complete freezing of the samples. They were again subjected to room temperature for 24 hours and permitted to thaw. This alternate freezing and thawing was repeated until all the samples under test had been frozen and thawed three times. Cans of the identical products, from the same lots, were held at room temperature as controls for subsequent comparison examination.

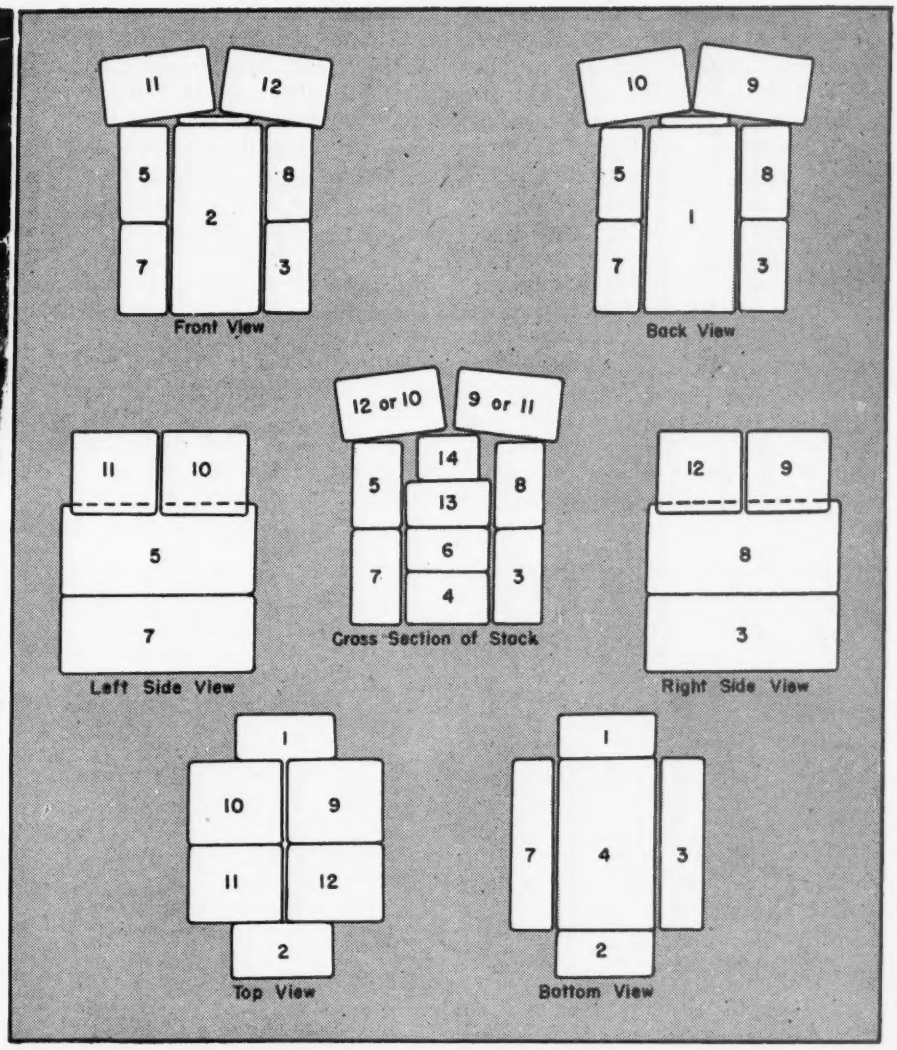
Results of the first part of the study show that canned meat products, which do not contain vegetables or starchy components, are affected very little by freezing. Pork sausage links, pork sausage meat, pork luncheon meat, corn pork loaf, beef and pork loaf, chopped pork and egg, chopped ham and eggs, ox tongue and pork tongues were found to be of the same quality as the samples which had not been frozen. In the case of Vienna sausage, the frozen samples showed some improvement over the unfrozen ones. They separated into the individual pieces of Vienna sausage much more readily than did the unfrozen. There were no other changes in this product. A thick jelly-like layer was found in the top of the cans of boned chicken or boned turkey which were frozen. However, this layer did not indicate any damage to the product because it again blended with the whole when the contents of the cans were heated. No appreciable loss of flavor was discerned. Corned beef which had been frozen did not slice as readily as the unfrozen, but the flavor and general appearance were equally as good.

Examinations showed that the canned meat products, which contain components with a high starch content, do not withstand freezing as well as do those without starchy components. The spaghetti, in meatballs-and-spaghetti, was very dry in appearance, although actually soggy in texture, and the cheese component was bunched together in small chunks. The flavor was decidedly in-

TABLE I—Identification of Cases Containing Various Commodities Under Study; Including Can Sizes and Type of Packing Case Used.

Case No.	Product	Can Size	Type of Case
1	Corned beef hash	6 lb. 12 oz.	Style 1 Nailed Wood Box
2	Ground meat and spaghetti	12 oz.	Style 1 Nailed Wood Box
3	Meat and beans	12 oz.	Style 1 Nailed Wood Box
4	Ham and eggs with potatoes	12 oz.	Style 1 Nailed Wood Box
5	Frankfurters and beans	12 oz.	Style 1 Nailed Wood Box
6	Chicken and vegetables	12 oz.	Style 1 Nailed Wood Box
7	Meat and noodles	12 oz.	Style 1 Nailed Wood Box
8	Meat and vegetable stew	12 oz.	Style 1 Nailed Wood Box
13	English style stew	30 oz.	Style 1 Nailed Wood Box
9	Pork and apple sauce	6 oz.	Fiberboard Box
10	Meat balls and spaghetti	30 oz.	Fiberboard Box
11	Ham with candied sweet potatoes	34 oz.	Fiberboard Box
12	Ham with raisin sauce	34 oz.	Fiberboard Box
14	Pork and corn	6 oz.	Fiberboard Box

FIG. 1. Cases of products under test were stacked to see if some "insulation" or protection was obtained from simulated shipping conditions. This diagram of a test stack shows location of cases identified in Table I.



ferior to the unfrozen product. In the cans of meat-and-vegetable-stew, meat-and-vegetable-hash and corned-beef-hash which had been frozen, the potatoes were soft and mushy and frequently had disintegrated into small pieces. An appreciable quantity of free moisture was found, and the flavor and general appearance were decidedly inferior to the unfrozen sample. The only appreciable damage due to the freezing of meat-and-beans was the liberation of an additional amount of free liquid in the can.

To avoid hasty conclusion that freezing damage results in inedibility, tests were made to determine whether the damaged products could or could not be used. By heating carefully with very little stirring the damaged products were found, for the most part, to be restorable to a palatable condition.

Because certain canned meat products do need protection against freezing to retain their acceptability, the second part of the study was made to find out if special protection is required for those products when shipped in the United States under conditions of freezing weather. To this end a reproducible test was conducted in which canned meat products were exposed to simulated winter shipping conditions.

To aid in setting up the details of the plans for this second part of the study, we had some experience data which were helpful. The Navy Liaison Office of the Q.M.C. Subsistence Research and Development Laboratory had previously conducted a test in cross-country shipping of canned beets from Plymouth, Wis., to the Naval Supply Depot at New Orleans, La. During travel of the shipment through the cold areas the outside temperatures for approximately 5 days ranged from 5 to 38 deg. F. The temperatures inside a loaded steel box car, lined with plywood, varied from 28 to 42 deg. F., and those inside a loaded wooden box car varied from 21 to 28 deg. F. during the shipment. These data gave us an indication of the relationship between outside and inside temperatures with respect to these two types of freight cars.

A survey of shipping routes indicates that, in general, a shipment originating in the Midwest is un-

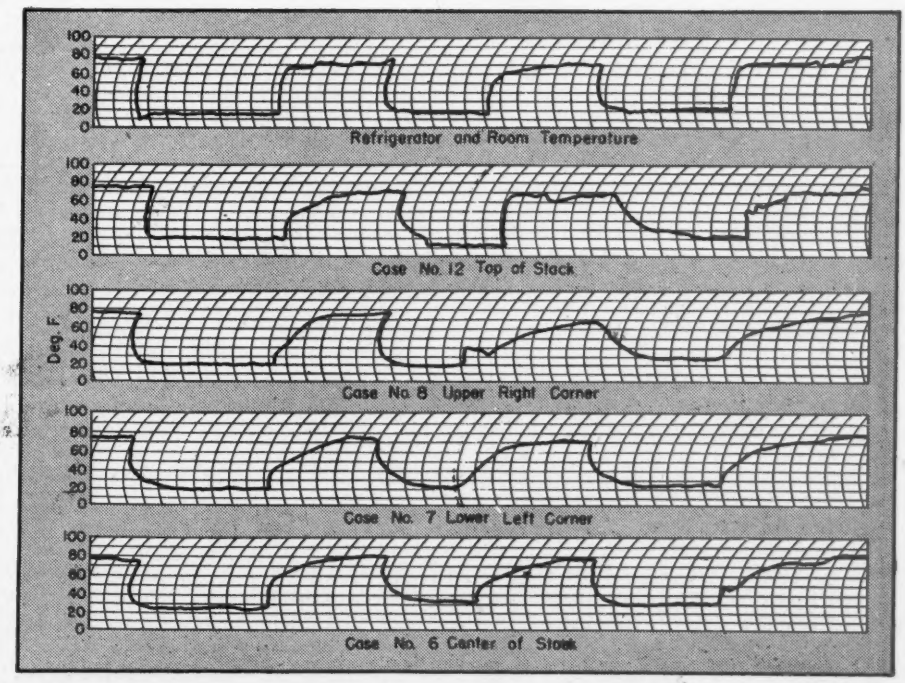


FIG. 2. Differences between the temperature of the atmosphere in which the products were stacked and that in the cases in various locations in the stack as determined by recording thermometers. Case and thermometer arrangement were identical for all 3-day cycles.

likely to be exposed continually to low temperatures for a period longer than three days unless unusual delays enroute are experienced. On the basis of these observations, decision was made to plan a study so that the commodities used would be stacked in an atmospheric temperature of 15 deg. F. for a 3-day period and then stacked for a 3-day period at room temperature (70-80 deg. F.).

Because of the possible recurrence of low temperatures while the shipment is enroute, the products were examined after they had been exposed to a low temperature more than once. Three periods of exposure to 15 deg. F. were decided upon because normal shipping conditions in the United States indicate that three exposures should be considered the maximum number of times that low temperatures can be expected during one shipping period. However, a study of the effects of one and two exposures was also desired. For that reason one set of samples of each product was added at the beginning of each 3-day period of cold exposure. In this way samples of the products were alternately exposed to 15 deg. F. and to room temperatures once, twice and three times.

Results of the first part of the study showed that canned meat products which do not contain an appreciable amount of carbohydrates will freeze with no deleterious effects. Since the temperatures to be used in the test simulating winter shipping conditions were not as cold as those previously used, the shipping condition test was made on only those products which contained carbohydrates. The products used and their can sizes are shown in Table I.

The cases containing the various products were stored at room temperature (70-80 deg. F.) for a month and then stacked in the refrigerator at a temperature of about 15 deg. F. Cases stacked in a box car will not all be exposed to the same temperatures. The succeeding layers of cases will cause a temperature gradient. Therefore, the products were stacked so that some cases would be directly exposed to the atmospheric temperatures, while others would be "insulated" by layers of adjacent outer

TABLE II—Summary of Results of Committee Examinations to Determine Comparative Acceptability of Commodities Under Study. Committee members were representatives of (A) Sub. Res. & Dev. Lab., (B) American Can Co., (C) Continental Can Co., and (D) Crown Can Co.

	A	B	C	D
Meat Balls and Spaghetti				
Control	Good quality.	Satisfactory except slight bitterness in flavor.	Normal except for slight bitter flavor.	Fair quality.
First cycle	Had slightly bitter taste.	Same as control.	Same as control.	Same as control.
Second cycle	Same as control.	Same as control except spaghetti slightly softer in texture.	Same as control.	Same as control.
Third cycle	Same as control except spaghetti grainy in texture.	Same as control except spaghetti softer and had slight granular texture. Starchy flavor.	Same as control except texture very slightly grainy.	Same as control.
English Style Stew				
Control	Normal appearance.	Satisfactory.	Normal.	Good quality.
First cycle	Same as control.	Same as control.	Same as control.	No change.
Second cycle	Same as control.	Same as control.	Same as control.	No change.
Third cycle	Same as control.	Same as control except product breaks apart slightly more easily.	Same as control.	No change.
Ham with Candied Sweet Potatoes				
Control	Good quality.	Satisfactory.	Normal.	Good quality.
First cycle	Same as control.	Same as control.	Same as control.	Same as control.
Second cycle	Same as control.	Same as control.	Same as control.	Same as control except sweet potatoes very slightly mushy.
Third cycle	Same as control.	Separation of liquids and solids. Sweet potatoes slightly mushy in texture.	Same as control except texture very slightly softer, somewhat matted.	Sweet potatoes slightly mushy, slightly brown in color.
Ham with Raisin Sauce				
Control	Fair quality.	Quality satisfactory except there was a slight liquid and fat separation.	Normal.	Good quality.
First cycle	Same as control.	Same as control.	Same as control.	Same as control.
Second cycle	Slight separation of liquid and solids. Slight drying of solid material.	Same as control except for slight separation of liquids and solids in sauce.	Same as control except appearance is slightly desiccated.	Same as control except slight loss of free sauce.
Third cycle	Nearly complete separation of liquids and solids. Raisins badly shriveled.	Complete separation of liquids and solids in sauce. Apparent dehydration of meat component.	Appearance slightly desiccated and darkened. Considerable free liquid.	Separation of liquids and solids. Product had a more dried out appearance.
Corned Beef Hash				
Control	Normal in appearance. Good quality.	No test.	Normal.	Normal in appearance. Good quality.
First cycle	Very slight amount of moisture. Slight discoloration.	No test.	Flavor and appearance satisfactory.	Slightly more free liquid than control. Good color.
Second cycle	Free moisture.	No test.	Free moisture. Slight darkening of potatoes.	Slight amount of free liquid. Slightly darkened. Solids have a slightly broken down appearance.
Third cycle	Moisture separated from solids. Solids dry in appearance. Slightly discolored. Watery flavor.	No test.	Considerable free moisture. Darkening of potatoes. Slight leaching of flavor.	Considerable free liquid. Darkened in appearance. Solids mushy and broken down in appearance.
Pork and Corn				
Control	Very good quality.	Satisfactory.	Normal.	Good quality.
First cycle	Same as control.	Same as control.	Same as control.	Same as control.
Second cycle	Same as control.	Same as control.	Same as control.	Same as control.
Third cycle	Same as control.	Same as control.	Same as control.	Same as control.
Pork and Apple Sauce				
Control	Good quality.	Satisfactory.	Normal.	Good quality.
First cycle	Same as control.	Same as control.	Same as control.	Same as control.
Second cycle	Same as control.	Same as control.	Same as control.	Same as control.
Third cycle	Same as control.	Same as control.	Same as control.	Same as control.

	A	B	C	D
		Frankfurters and Beans		
Control	Good quality.	Satisfactory.	Normal.	Good quality.
First cycle	Same as control.	Same as control.	Same as control.	Same as control.
Second cycle	Same as control.	Same as control.	Same as control.	Same as control.
Third cycle	Same as control.	Same as control except flavor slightly flat, beans are slightly softer.	Same as control.	Same as control.
		Ham and Eggs with Potatoes		
Control	Same quality as is usually manufactured.	Satisfactory.	Normal.	Good quality.
First cycle	Same as control.	Same as control.	Same as control.	Same as control.
Second cycle	Same as control except potatoes slightly softer.	Same as control.	Same as control.	Same as control except texture very slightly softer.
Third cycle	Same as control except texture slightly softer.	Same as control except eggs are slightly more grainy in texture and appearance.	Same as control.	Same as control except texture slightly softer.
		Meat and Vegetable Stew		
Control	Very good quality.	Satisfactory.	Normal.	Good quality.
First cycle	Same as control.	Same as control.	Same as control.	Same as control.
Second cycle	Same as control.	Same as control.	Same as control.	Same as control.
Third cycle	Same as control except potatoes had a slight watery taste.	Same as control.	Same as control.	Same as control.
		Meat and Noodles		
Control	Good quality except very light in color.	Satisfactory.	Normal.	Good quality product.
First cycle	Same as control.	Same as control.	Same as control.	Same as control.
Second cycle	Same as control.	Same as control.	Same as control.	Same as control.
Third cycle	Same as control except slightly drier.	Same as control.	Same as control.	Same as control.
		Ground Meat and Spaghetti		
Control	Good quality of product. Tomato puree light in color.	Satisfactory.	Normal.	Good quality of product.
First cycle	Same as control.	Same as control.	Same as control except texture slightly grainy.	Same as control.
Second cycle	Same as control.	Same as control except spaghetti was a little softer in texture and product had a grainy appearance.	Same as control except a very slight amount of free moisture. Slight amount of graininess in texture.	Very small amount of free liquid, otherwise same as control.
Third cycle	Slightly soft in texture. Very slight amount of free moisture. Slight loss in flavor.	Spaghetti soft in texture. Granular and flat in taste. Product grainy in appearance. Slight loss in flavor.	Slight amount of free moisture. Grainy in texture.	Some free liquid. Slightly soft in texture. Slightly grainy in appearance.
		Chicken and Vegetables		
Control	Good quality product.	Matted together. Excessive starchy flavor.	Normal	Good quality product.
First cycle	Same as control.	Same as control except very slight starchy flavor.	Same as control.	Same as control.
Second cycle	Texture very slightly drier, and rice grains slightly harder.	Same as control.	Same as control.	Same as control except texture slightly softer.
Third cycle	Texture drier and rice grains harder.	Product had definite flat starchy flavor, rather granular texture of rice.	Very slight loss in flavor and texture. Product slightly more matted in appearance than control.	Same as control except texture slightly inferior.
		Meat and Beans		
Control	Good quality of product, slightly light in color.	Satisfactory.	Normal.	Good quality.
First cycle	Same as control.	Same as control except beans slightly harder.	Same as control.	Same as control.
Second cycle	Same as control.	Same as control.	Same as control.	Same as control.
Third cycle	Same as control except beans were slightly hardened.	Beans slightly harder, more yellow in color.	Same as control except a very slight flavor loss.	Same as control.

cases. In this way an attempt was made to duplicate conditions likely to be found in a freight car. The arrangement of the cases in the stack is shown in Fig. 1. The numbered cases are identified as to commodity and type of packing case in Table I. To obtain the temperature gradient throughout the stack, recording thermometers were located at the top of the stack in case No. 12, in the upper right corner in case No. 8, in the lower left corner in case No. 7, and in the center of the stack in case No. 6. A recording thermometer was placed close to the stack to record the inside atmospheric temperatures. All thermometers checked within one degree of temperature difference. The arrangement of the cases in the stack and the location of the thermometers were identical for all 3-day cycles of cold exposure and room temperature. Fig. 2 shows the temperatures that were recorded during each of the 3-day cycles. This record shows that the temperatures inside some of the cases were not as cold as the atmospheric temperature of approximately 15 deg. F.

A committee compared exposed samples with controls for acceptability. A summary of the comments made by the committee is given in Table II. These results show that none of the samples except corned-beef-hash suffered any deleterious effect after one exposure to cold. Corned-beef-hash, chicken-and-vegetable and ham-with-raisin-sauce were the only commodities damaged by exposure to the cold twice. In addition to those damaged during the second exposure to cold, ground-meat-and-spaghetti, ham-and-eggs-with-potatoes, meat-balls-and-spaghetti, and ham - with - candied - sweet-potatoes were found to be slightly damaged by exposing them to the cold three times. While these products showed slight deterioration, they were still considered acceptable.

Corned-beef-hash was found to be damaged slightly by the first cold exposure and severely damaged after the second and third exposures. The changes were similar to those previously observed when this product was frozen at –30 deg. F. There was a distinct separation of solids and liquids and the solids were soft and mushy in texture. Ham-with-raisin-sauce was found to have a separation of liquid and solids in the sauce component after the second exposure to

(*Turn to page* 234)

SWEET POTATO GELS — Something New*

They are vitamin-rich foods adaptable to many purposes and could become important by-products. Argentina manufactures them on a comparatively large scale. The authors tell how the gels are made

By G. L. BAKER and C. W. WOODMANSEE**
Delaware Agricultural Experiment Station, Newark, Del.

COMPARATIVELY large-scale manufacture of gelled sweet potato products is carried on in the Argentine. Agar was used as the gelling agent before the war and now, since the agar supply from Japan has been cut off, extractives from Irish Moss (*Chondrus crispus*) have proved the most satisfactory. Estimates, based on the known consumption of Irish Moss extractives for this purpose, would indicate that approximately 1,000,000 lb. of overly large or small sweet potatoes must have been consumed in the gels, or "pastes," in Argentina during the last year.

The practice in Argentina has been to pack the sweet potato "paste," or gel, in tins about 8 in. in diameter and ¾ in. in thickness. The product was naturally flavored, without spice, which might make it unattractive to North American tastes. However, the thought persists that a similar product might be acceptable in the United States, especially if properly spiced. Sample gels have been made at the Delaware Agricultural Experiment Station using various gelling agents at several soluble solids levels. Powdered mixtures which would produce gels upon adding water, heating and cooling have been prepared. These mixtures are thought to have postwar applications. A resume of experimental results is given in this article.

Preliminary Experiments

Initial products were made from baked or boiled sweet potatoes blended with water to a standard mixture of 10 and 15 percent potato solids, and then gelled with a low-methoxyl pectin (5.5 percent CH_3O) and sugar sufficient to raise the soluble solids content in the finished gel to 20 and 25 percent. The initial pH of the potato mix was 5.9. Since darkening occurred readily at this pH, citric acid was added and was found to effectively prevent darkening when the pH was about 5.0. However, while satisfactory gels were obtained with the low-sugar, gelling pectinates, considerable difficulty attended the proper adjustment of the calcium-ion concentration for best condition of gelation.

As larger quantities of gelling agents of the agar type became available during the past two years, their applicability in gelation of sweet potato products was tried out. The Irish Moss extractives* proved the most satisfactory of this group. These extractives require an optimum concentration of potassium salts for proper jellying. While, like agar, the extractives are easily hydrolyzed in acid mixtures, especially at high temperatures, they can be used with modifications under moderately acid conditions. At pH 5.5, the extractives were able to withstand for short periods a finishing temperature of 221 deg. F., or the temperature which accompanies boiling at a concentration of 65 percent soluble solids. Tests showed that it was best to try to raise the solids of the final gel mixture sufficiently so that the product needed to be merely heated through in order to obtain a 65 percent soluble concentration. Such a product might be canned and then processed. The Irish Moss extractives are progressively more resistant to acids in products requiring lower finishing temperatures.

Citric acid, 0.125 percent of the finished gel, was found satisfactory in preserving the natural color of the sweet potato. This is approximately the same as Woodroof and Atkinson[3] found with frozen sweet potato purees. Acid improves color and accentuates natural flavor. Flavoring or seasoning can be added previous to pouring.

Preparation of Potatoes

The sweet potatoes were washed and scrubbed, then boiled in water until soft, peeled and run through a pulper with water sufficient to adjust the soluble solids to 12 percent. Pressure sterilization previous to the addition of gelling agents is advisable because sterilization at pH 5.5 will tend to destroy the natural jellying properties of the Irish Moss extractives. The extractives should be sterilized at pH 7 in order to avoid loss of jellying capacity.

Gels

The gels were made, using various ingredients on a parts by weight basis, as follows:

With 1.67 parts of Carragar (this Irish Moss extractive product contained necessary potassium salts for gelation) were mixed 8.33 parts of powdered corn sugar (dextrose). This mixture was stirred into 100 parts of potato pulp, prepared as above, then 75 parts of ordinary sugar (sucrose) and 16.67 parts more of corn sugar were added and the whole boiled to 65 percent soluble solids content (temperature of 221 deg. F., or to proper weight). Flavor and seasoning was added as desired. The sample products were packed and sealed in glass jars.

These gels were purposely made very strong in order to compare with the Argentine product. When measured with Delaware Jelly Strength Tester,[1] more than 300 cm. water pressure was registered. The gels

* Published with the approval of the Director, George L. Schuster, Delaware Agricultural Experiment Station.
** Acknowledgment is made of the aid of V. E. Pollari and W. G. Murray in experimental work with the dehydrated potatoes.

* Furnished by Krim-Ko Co., Scituate, Mass.

were stiff enough to be sliced and eaten while held in the fingers. However, the concentration of the Irish Moss extractive can be decreased and the strength of the gel reduced accordingly.

The powdered corn sugar may be replaced with glucose or invert sirup. But a mixture of dextrose and sucrose is necessary in order to prevent crystallization of the sugars because insufficient inversion of sucrose takes place during cooking at the high pH of the mixture. About 25 to 40 percent of the sugars in the finished gel should be glucose or invert sugars.

Gels from Powdered Mixes

Samples of dehydrated sweet potatoes were used in the preparation of experimental powdered products which would gel upon adding water, heating and cooling. Products of this nature can be used for puddings, pie fillings or in place of candied sweet potatoes by slight changes in the formula. Woodroof and Atkinson[3] found that dehydrated sweet potatoes tended to produce pies with a coarse texture and a very soft consistency because of the loss of binding properties. They stated that the pies were too watery to be cut well. It is apparent from their studies that some jellying and thickening agent is necessary for pies made from dehydrated potatoes.

Since it is evident that recipes can be varied in many ways, only one which is representative of a gel which would be satisfactory for pie fillings will be presented here.

The powder was made of the following ingredients (parts by weight basis):

Potato powder.....	7.50 parts
Dextrose 20.00	parts
Sucrose 15.00	parts
Carragar (Irish moss extractive containing potassium salt)	0.75 parts
Common salt	0.15 parts
Cinnamon	0.10 parts
Nutmeg	0.05 parts

These dry ingredients were mixed carefully, then 65 parts of water was added and the mixture allowed to soak for 15 minutes to soften the potato. After the soaking period, the mixture was boiled slowly and with stirring for five minutes, then remade to 100 parts with water, poured into glasses and sealed. The product was firm but, as is characteristic of products gelled with extractives from Irish Moss, it had a desirable texture. If desired, the gel product can be remelted (about 120 deg. F.) and then it will reset at about 105 deg. F. Some strength is lost during melting and resetting.

Two varieties of dehydrated sweet potatoes were used in the experiments—Maryland Golden and Unit I Porto Rico varieties.* Of these two, the powdered Unit I Porto Rico sweet potato seemed to make the better flavored gels when spices were present. Both products seemed to soften up satisfactorily following 15 minutes of soaking and 5 minutes of boiling. A particle size small enough to pass a 60-mesh screen appeared satisfactory for proper softening during this treatment. More than 7.5 parts of potato powder introduced too much sweet potato flavor into the gels when either variety was used. The pH reaction of gels made from the powdered mixture containing the dehydrated Maryland Golden sweet potato was 5.42 in comparison to 5.55 for gels containing the Unit I Porto Rico variety. The former gels had slightly higher (about 10 deg. F.) melting and setting temperatures. No acid was required with either product.

The powdered mixture of dehydrated sweet potatoes, sugars, gelling agent and flavoring materials can be a versatile food.

Sweet potatoes contain very large amounts of vitamin A, appreciable amounts of vitamin C, and small amounts of thiamine, riboflavin and niacin. More l-ascorbic acid (vitamin C) may be added to the powder if desired, and it will be fairly stable if the powdered mixture is properly packaged. The food value of the sweet potato powder is sufficiently high to warrant its use.

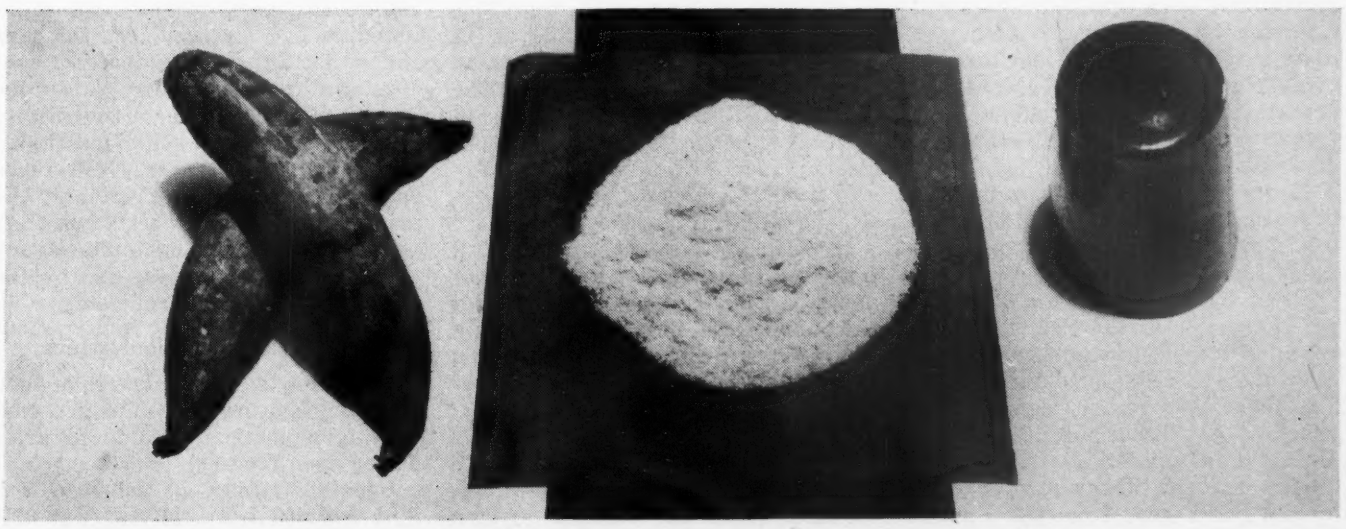
Conclusion

Sweet potato gels or dehydrated sweet potato gelling mixtures are suggested as food products, rich in vitamins, which are adaptable for many purposes. They offer opportunities for the development of a larger byproduct industry.

* The former was obtained through the courtesy of Dr. C. H. Mahoney, University of Maryland, College Park, Md., and the latter through that of Dr. J. C. Miller, Louisiana State University, Baton Rouge, La.

References

1. G. L. Baker, Improved Delaware Jelly Strength Tester, *Fruit Products Journal*, vol. 17, 329, 1938.
2. G. A. Shuey, New Uses for the Sweet Potato, University of Tennessee Agricultural Experiment Station, Circular 43, 1932.
3. J. G. Woodroof and I. S. Atkinson, Preserving Sweet Potatoes by Freezing, Georgia Experiment Station Bulletin 232, 1944.



Sweet potatoes (left) may be dehydrated and the dry product mixed with sugars, flavoring ingredients, and jellying or thickening agent as a powder (center). Upon the addition of water, followed by heating and cooling, the powder will make pie fillings, puddings or a gel (right) which may be served in a variety of ways.

If either a buyer or a seller breaches a valid contract he is liable for damages suffered by the other.

Keeping An Eye On Law Suits

Technical and operating men should know these rulings. The justice of one of them is hard to understand, but it forms a dangerous precedent through which damages can be collected from innocent manufacturers

By LEO T. PARKER, Attorney at Law, Cincinnati, Ohio

FOOD PACKERS can guard against future lawsuits by becoming familiar with legal controversies in which other packers recently have been involved. A knowledge of the cause and outcome of these suits obviously assists them to avoid similar litigations. Moreover, new citations should be "clipped" for future reference and use for defense of unavoidable lawsuits.

Modern higher courts consistently hold that if either a buyer or seller breaches a valid contract of sale he is liable for the full damages suffered.

For illustration, in *Vagim* v. *Empire Packing Co.*, 146 Pac. (2d) 923, reported March, it was shown that a man named Vagim sued the Empire Packing Co. to recover damages because of the latter's failure to deliver raisins under a written contract. The testimony proved that Vagim purchased, from the Empire Packing Co., 190,000 lb. of choice or custom grade raisins, packed in 25 lb. fiber boxes, at an agreed price of 3 cents per lb. to be delivered in February, March, and April. Vagim demanded delivery but the Empire Packing Co. refused to deliver more than 38,700 lb. Vagim was therefore required to purchase 134,300 lb. in the open market, and pay therefor 4⅜ cents per lb. By reason of the failure of Empire Packing Co. to comply with the terms of the contract, damages were sought by Vagim in the sum of $1,863.17, representing the difference in price.

In holding Vagim entitled to a full recovery, the higher court said that a seller who breaches a valid contract is liable in damages amounting to the full and complete financial loss sustained by the purchaser as a result of the breach.

Therefore, persons who enter into valid contracts should be certain to either fulfill the assumed obligations, or compromise the controversy and obtain a written "release" from future liability on the contract.

Also, see *Long* v. *Rogers*, 185 S.W. (2d) 863, reported May, 1945. The facts of this case are that a seller agreed to sell a specified quantity of corn. After approximately 160 bu. had been delivered the seller found he had no more corn to spare and so notified the purchaser.

In holding the seller liable for breach of the contract, the higher court said that the seller was liable to the purchaser for the difference between the contract price and the price which the purchaser was compelled to pay on the open market for the balance of the corn, due by the terms of the original contract.

Flour Poisoned Consumers

Very frequently consumers of food sue manufacturers for damages, contending that they became ill after eating such food.

For illustration, in *Jones* v. *Ballard & Ballard Co.*, 21 So. (2d) 327, reported April, 1945, the testimony conclusively proved that a woman purchased a sack of flour. The sack

was in good condition, without holes. The woman and other members of her family were poisoned by biscuits made from such flour. About a pint of this flour was taken from the bin, where it had been placed by the woman, and delivered to a toxicologist, who made an analysis and discovered in the flour a white fleecy substance that proved to be calcium arsenate. The chemist also testified that there was a sufficient amount of arsenic in a quart of such flour to make a fatal dose for ten people, if absorbed, and not thrown off through vomiting.

The woman sued the flour manufacturer for heavy damages. The manufacturer proved the efficiency of its process of manufacturing flour for sixty odd years, and that it uses the most modern equipment and machinery. Other evidence was given by the manufacturer that during 60 years no other similar complaints had been made that its flour was poisonous. However, the jury held the flour manufacturer liable and the higher court approved the verdict, saying:

"Where the manufacturer puts the goods upon the market in sealed cans or packages, he in effect represents that the contents of each can or package are suited to the purpose for which such can or package is sold."

There are at least four plans by which this manufacturer may have won this suit. First, by proving that the poison may have entered the flour *after* it left the plant, and before reaching the consumer; second, by proving that the woman kept similar poison on her premises, or in her kitchen thus leaving a doubt in the minds of the jury that the poison was in the flour when she purchased it; third, by the introduction of testimony tending to prove unreliableness of the woman, or that previously in another suit she had given false testimony; and fourth, the consumer failed to use reasonable care.

See *Cantt* v. *Columbia Bottling Co.*, 29 S.E. (2d) 488, reported May, 1944, where a consumer sued a bottling company to recover $2,000 damages alleged to have been sustained as a result of drinking from a bottle which he claimed contained bluestone. The lower court held the company liable for $2,000 damages.

However, the counsel for the bottling company appealed to the higher court and proved that the consumer had previously pleaded guilty in the United States District Court to violation of the Internal Revenue Law relating to distilling whiskey with intent to defraud the United States of the tax imposed on such whiskey. In other words, the consumer had been convicted as a "moonshiner" of whiskey. In view of this testimony the higher court reduced the damages.

Also, see *Gordon* v. *Nehi Beverage Co.*, 183 S. W. (2d) 795, reported January, 1945, where the testimony proved that a bottle exploded injuring the purchaser. This court said:

"Suppose the bottle was defective. A conclusion of negligence (of the manufacturer) could not arise without showing that the defect could have been discovered by the exercise of ordinary care."

Carton Not Infringement

A manufacturer, who adopts a new trade-mark, label or design, should use great care *not* to imitate any other mark or symbol used by a competitor in the same business classification. In litigations of this kind the question for the court to determine is: "Are the two so similar that a person, using such care as the public in general may be expected to exercise, might buy one product when he intended to buy the other?" If the answer is in the negative, no infringement exists.

For example, in *George H. Dentler & Sons* v. *Fuller's Food Products*, 183 S.W. (2d) 768, reported December, 1944, a company that packed potato chips in paper cartons sued a competitor for infringement of its label, design and trade-mark. However, since there was no marked similarity, the higher court refused to hold that one package infringed the other. The court explained that the two labels, designs and trade-marks, when considered as a whole are not so similar that the buying public will be confused.

On the other hand, see *Roche* v. *Newark*, 148 Fed. (2d) 557, reported April, 1945. In this case the court held that a new trade-mark "Rox" was "too" similar to an old trade-mark "Roche" to permit use of "Rox" on the same class of merchandise.

Yet, if the merchandise is *not* in the same class, two similar trade-marks may be used without one infringing the other. See Atlas, 148 Fed. (2d) 1016, reported June, 1945, where the court said that it was legal for two manufacturers to use the *same* trade-mark on different kinds of merchandise, because the public would not be confused.

A common carrier is not liable for spoilage, according to a recent higher court decision, if it handled the shipment as quickly as it reasonably could over its regular trains.

City Not Satisfied

When any contract specifies that one of the contracting parties will "satisfy" the other party, or perform "satisfactory," this statement does *not* mean that the latter party is privileged to demand "unreasonable" performance.

For example, in *National Grain Yeast Corp.* v. *City of Crystal Lake,* 147 Fed. (2d) 711, reported May, 1945, the testimony proved that a yeast manufacturer constructed a plant in a municipality after making a contract with the city giving it the privilege of emptying its waste into the city's sewers for five years with the option of renewal "providing conditions are *satisfactory* to both parties hereto, at the expiration of this agreement."

In the process of making yeast, heat is generated that must be overcome. Water is used as the cooling agent. There is waste water in the process that has an objectionable odor. The municipal officials complained of the odors arising from the waste waters emptied into the sewerage system. The manufacturer applied to the War Production Board for priority of the critical materials required for the installation of a new closed system. It was awarded the piority. However, before the manufacturer could construct the tanks, the city officials threatened to close the shut-off valve of its sewer.

The manufacturer filed suit and asked the court to compel the city to renew its contract for five years because it was doing everything within its power to operate its plant "satisfactory" to the city officials. In holding in favor of the manufacturer, the higher court said:

"Where a contract is required to be done to the satisfaction of one of the parties, the meaning necessarily is that it must be done in a manner satisfactory to the mind of a reasonable man."

Carrier Not Liable

According to a late higher court decision, a common carrier is not liable for spoilage of perishable merchandise if it handled the shipment as quickly as it reasonably could over its regular trains.

For example, in *St. Louis-San Francisco Ry. Co.* v. *J. W. Meyers Com'n. Co.,* 185 S.W. (2d) 289, reported May, 1945, it was shown that a shipper sued a common carrier for the value of a carload of green corn that spoiled as a result of delay of the carrier in making delivery.

During the trial, the carrier proved that it had handled the shipment as expeditiously as its train service provided under the regular schedules. Upon consignee's refusal to accept the shipment the carrier sold it at the highest price obtainable. The higher court held that carrier liable only for the amount it had received from sale of the corn, and said:

"There was no showing whatever upon which could be based a finding that this shipment was not handled as expeditiously as the train service, provided under the regular schedules, would permit."

Trade-Mark Invalid

A name that is merely descriptive of the ingredients, qualities or characteristics of an article of food cannot be appropriated as a trademark.

For instance, in *Skinner Mfg. Co.* v. *General Foods Sales Co., Inc.,* 143 Fed. (2d) 895, reported October, 1944, it was shown that Skinner Manufacturing Co., since 1925, had sold a breakfast food under the name "Raisin-BRAN." In 1942 certain competitors commenced to market a similar breakfast food under a name that included the words "Raisin Bran." The Skinner Manufacturing Co. sued for infringement of its trade-mark. However, the higher court held that no infringement existed, and said:

"The name 'Raisin-BRAN' is descriptive of ingredients of appellant's (Skinner) breakfast food. Without the raisins the product would appropriately have been called 'bran flakes' or 'bran.' The name 'Raisin-BRAN' could not be appropriated as a trade-mark."

Taxation Law Void

It is well established law that all arbitrary and discriminatory food tax laws are void.

For example, in *Thorin* v. *Burke,* 18 N. W. (2d) 664, reported July. 1945, it was shown that a state passed a taxation law that required payment of a tax of 15 cents per lb. on imitation butter. The law further provides that butter produced from pure milk or cream is not taxable, and oleomargarine or imitation butter containing more than 50 percent animal fats or animal oils produced in the United States, and containing no imported oils or fats, is not taxable. In other words, briefly a margarine containing 51 percent animal fats and the balance domestic cottonseed oil is nontaxable, but a margarine containing 51 percent animal fats and the balance imported cotton-seed oil is taxable.

The court held the law arbitrary and discriminatory and, therefore, void, saying:

"There is no difference between imported cottonseed oil and domestic cottonseed oil. They are identical."

Also, see the leading case of *Carolene Products Co.* v. *Banning,* 131 Neb. 429. In this case, the higher court held void a state law that prohibits the manufacture, sale and distribution of a food product composed of evaporated skim milk and coconut oil, both of which are wholesome and nutritious.

On the other hand, see the unusual Georgia case, *Coy* v. *Linder,* 183 Ga. 583. In this case, a state excise tax of ten cents a pound was imposed on all margarine sold or offered for sale "containing any fat." . . .

Technical Misbranding

Modern higher courts consistently hold that technical misbranding may result in use of *truthful* description in violation to the regulations of the Federal administrator.

For illustration, in *Libby, McNeill & Libby* v. *United States,* 148 Fed. (2d) 71, reported May, 1945, it was shown that the government, acting under authority of 401, 21 U.S.C.A. 343(g), (k), 341 condemned a shipment of tomato catsup, with a preservative known as sodium benzoate, which is a harmless chemical. The company sold the product, *not* as catsup but as "tomato catsup with preservative."

During the trial the testimony proved that this preservative is harmless and commonly used in many other foods.

The higher court upheld the government's condemnation proceedings because the product does not conform with the standard regulations for catsup. Although the product was truthfully labeled, the higher court held that it was misbranded and subject to condemnation.

And again, see *Federal Security Administrator* v. *Quaker Oats Co.,* 318 U. S. 218, where a food manufacturer had labeled its product "Quaker Farina Wheat Cereal, Enriched with Vitamin D."

Although the product was truthfully labeled, the higher court held that technically it was misbranded because the label did not conform to the government standards for either farina or enriched farina.

Misrepresentation

According to a late higher court decision a seller who mislabels a food is not guilty of "misrepresenting" his product if the buyer fails to read the label. He is guilty of mislabeling and misbranding, however, even

though the label did not influence the buyer.

For illustration, in *People* v. *Beggs*, 160 Pac. (2d) 600, reported August, 1945, it was shown that a seller shipped onions in sacks bearing labels that read: "Texas Onions 50 lbs. net weight." Most of the sacks never had contained as much as 50 lb. of onions, and the seller was convicted in the lower court of wilfully and unlawfully selling an article of food mislabeled and misbranded. Also, the seller was convicted of "misrepresenting" to the buyer that the sacks contained 50 lb. of onions. The higher court upheld the first conviction, but reversed the later, saying:

"A statement made but not heard by the buyer, consequently, would not 'represent' a higher quantity than the true quantity, nor would a legend on a sack, never seen by the buyer, constitute a representation."

Registration Limits

Many food manufacturers erroneously believe that they own and have exclusive rights in all states on labels and trade-marks registered in the United States Patent Office. The latest higher court decision involving this unusual law is *Western Brewery Co.* v. *Peoples Brewing Co.*, 149 Fed. (2d) 1019, reported August, 1945. The Western Brewery Co. sued the Peoples Brewing Co. for infringement of its registered trade-mark and copyrighted labels.

The testimony proved facts, as follows: The Western Co. is the owner of copyrights and also a certificate of trade-mark registration issued by the Commissioner of Patents of the United States on January 1, 1935, for the trade-mark "Stag." This company began to use the trade-mark "Stag" in 1908 and since that time has sold and advertised its "Stag" beer in Missouri, Kansas, Arkansas, Oklahoma, Texas, Tennessee, Georgia, Alabama, Mississippi, Louisiana, Iowa, and Illinois.

The Peoples Co. began using the trade-mark "Stag" for beer in the State of Minnesota in the year 1938.

Thus, both companies are using the same trade-mark on the same products in different localities.

Although the Western Co., held registration of its trade-mark, the higher court refused to hold the Peoples Co. liable for infringement, and said:

"....The right to the exclusive use of a trade-mark or trade-name is limited to the territory or market wherein it has become established by use in such territory...."

A Heil stainless steel, one-compartment trailer tank is employed by Haffenreffer & Co., Inc., Boston, to pick up residue yeast outside the city and haul it to its own yeast processing plant. The tank has a capacity of 25,000 lb. The fluid yeast is loaded through the manhole on the tank top and unloaded through a discharge pipe at the rear. Collections are from nearby New England cities and the outward trip is always made empty.

Tank Trucks Haul Yeast and Malt

Glass-lined and stainless steel tanks are used by a Boston brewer, who also employs a fleet of low platform trucks for economy in beer and ale deliveries

HAULAGE of liquid yeast, the transfer of malt loaded by pneumatic means, and the final delivery of beer and ale to customers are the three separate and distinct types of automotive transportation provided by the fleet of motor trucks operated by Haffenreffer & Co., Inc., brewers, of Boston.

Since each type of transportation presents its own problems, they will be outlined separately. The haulage of the liquid yeast, a by-product of beer making, and the final consumer deliveries will be analyzed here, leaving for a subsequent issue of FOOD INDUSTRIES the description of the special Holly Pneumatic System used for transporting malt, in bulk, in a tank truck instead of in individual 100 lb. bags.

The haulage of the Haffenreffer liquid yeast is divided into two parts, that picked up from other brewers within the city of Boston and that collected from breweries in outlying cities. From the latter breweries, the longest round trip haul of the Haffenreffer vehicle is 125 miles. On the shorter local Boston pickups, a straight truck of 20,000-lb. payload capacity is used. On the longer hauls, a tractor-trailer combination with a 25,000-lb. payload capacity is employed.

Because the yeast is in liquid form, tanks are used on all the hauls. The tank used on the short-haul pickups is a glass-lined Pfaudler. It is mounted on a conventional two-axle, pneumatic-tired White truck.

The tank is about 6 ft. in diameter and 8 ft. long and is mounted in a cradle just forward of the truck's rear axle. The tank has only one compartment, which is glass-lined, although the outer shell is in three longitudinal sections with riveted flanges to provide greater strength and rigidity.

The top of the truck chassis frame is decked over with a metal plate be-

tween the rear of the driver's cab and the front end of the tank. This helps to keep the tank clean.

The long distance trailer tank is made of stainless steel. It is of the elliptical cross-section type with but one campartment and is of Heil manufacture. It is loaded through one manhole at the top center of the tank and unloaded through one discharge pipe at the bottom rear.

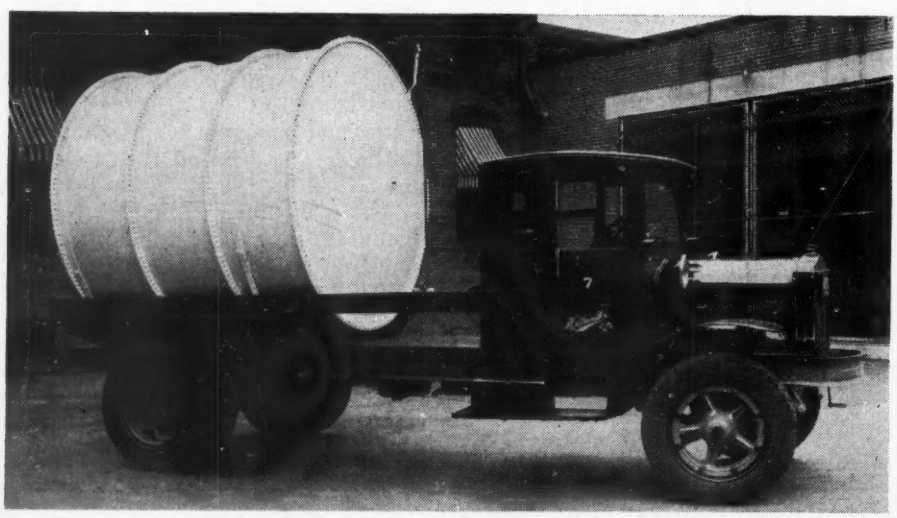
Both the yeast truck and tractor-trailer are loaded only on inbound trips. Because the yeast is still active while in transit, the tanks must be washed and sterilized after each trip. After the tanks are scrubbed thoroughly with lime, they are rinsed with a water-chlorine solution.

After collection of large quantities of the excess yeast from plants in Boston proper and from breweries in the nearby New England cities, it is delivered to the Haffenreffer yeast processing plant which was started during the war. The final delivery of the company's products, known by the brand name Pickwick Ale and Light Pickwick Ale, is made by a fleet of 30 trucks. The delivery area covered comprises Greater Boston only. All deliveries beyond are handled by outside distributors.

The outstanding feature of the final delivery trucks is a low-slung platform body used to reduce the height between the body floor and the street or sidewalk. In unloading, this lessens the distance the full barrels have to be dropped. In loading, empty kegs have to be lifted a shorter height to get them on the truck. The bodies, similar to the White Model 718, have separate cabs, with headboards at the front to prevent the loaded barrels from striking the backs of the cabs.

The trucks have low platforms, which are achieved by eliminating the usual longitudinal sills mounted on top of the chassis side frame members and placing the cross sills directly on top of the chassis frame. The body flooring is laid longitudinally on top of the cross sills. This construction brings the body floor down approximately eight inches nearer the ground.

One of the special, low-platform White trucks used by Haffenreffer for the final delivery of Pickwick Ale and Light Ale in the Greater Boston area. Three of the six name boards can be seen here, as can the rear wheel housing, the side stakes and the three rows of quick opening chains for easy unloading. The pillow is made of canvas and is cork-filled.



This glass-lined Pfaudler tank, mounted on a White chassis, is used by the Haffenreffer brewery to collect residue yeast within the city. After each trip the tank is scrubbed.

Easy Loading

The body has no roof or sides. This permits side loading or unloading from or to the sidewalk along the entire length of the body. The lack of a roof is not a disadvantage since rain or snow cannot damage the wooden or metal kegs.

However, the low body floor and the full body-length unloading and loading speed up the delivery operation and tend to reduce damage to the kegs in unloading. Such damage is further lessened by the use of a canvas pillow filled with ground cork. The driver places the pillow on the sidewalk and allows the keg to drop onto it in unloading, thus cushioning the fall. The cork-filled pillow serves the same purpose as the rope bumper used by many breweries before the war.

The kegs are prevented from falling off, while the truck is in motion, by the proper stacking of the kegs as well as by side stakes joined by chains. The chains are three rows high. One end of each chain is fastened permanently to one of the stakes by a metal ring. The other end is fitted with a quick-opening fastener. This arrangement permits any group of chains along the body length to be unfastened so that the barrels may be unloaded directly onto the sidewalk without any longitudinal movement on the body itself. Due to the low floor height, wheel housings have to be provided over the rear wheels. However, kegs are carried on the tops of the wheel housings.

The greatest possible use of the sideless body for advertising purposes is made through no less than six Pickwick Ale name signs. These include two front and rear signs on the top of the body headboard, two on side sign panels fastened to the stakes near the rear end of the truck, and two on apron side panels below the body floor.

EDITORIALS

LAURENCE V. BURTON, Editor

Packers' Strike Is Really Dynamite

IF the high wage demands on the meat packing industry are imposed, the repercussions are likely to be surprising whether OPA holds the ceilings or not. For, the majority of the products from meat packers are perishable and can be sold only at prices the public is willing to pay.

Ever since the industry got started in a big way, the number of animals sent to market is determined by the farmers. They control the volume. But the prices the farmers get are determined by what the public will pay for dressed meat. At every wholesale meat market there is the equivalent of a small auction. The prices obtained are quickly reflected in another auction in the stock yards where the live stock buyers bid against each other for the animals.

In between these two auctions is the meat packer who performs a necessary service. His only way to escape a price pinch is to bid less for live animals or else put the meat into cure, converting it into a semi-perishable that can be held for a few months for higher prices, and maybe overdoing the job and thereby taking an awful shellacking. If he tries to hold up the public for too high prices his fresh meat will spoil. So, he is forced to sell at what the public willingly pays.

If Chester Bowles permits sales at the higher prices the public is willing to pay today the increased cost of labor will be passed on to all the people. If Chester Bowles stands pat: the farmer will either receive less; the government will be forced to subsidize the increase, in which case everybody—the public—pays via the tax route instead of the butcher store; or the packers will go broke and out of business.

On the other hand, if the farmers are forced to take enough lower prices to balance wage demands their political might will be quickly mobilized and Congressional action will inevitably follow. And Labor is not likely to enjoy the action.

Needed: Improved Specifications for Packaging Supplies

OUT of a lengthy discussion on problems of inspecting incoming packaging supplies it has become apparent that liaison (exchange of knowledge) between supplier and customer could be improved to everybody's advantage. The chief offender, we are sorry to say, is the buyer, who in the present case is the food manufacturer. Very plainly stated, he seldom knows, in specific terms, exactly what he wants.

By specific terms are meant specifications such as: size; color limits; weight; thickness; surface; coating, both thickness, properties and freedom from uncoated areas; moisture content, both maximum or minimum; strength; wet strength; rate of moisture-vapor transfer; rate of oxygen transfer; temperature of heat-sealing; freedom from odors; types of printing inks or their vehicles; and similar physical data. If the buyer does not know exactly what he wants the supplier has to guess at it. Maybe he guesses right—and maybe not.

Big firms usually have packaging laboratories to determine exactly what they want. Others seem to prefer the guessing method, supplemented by *plant scale* (!) trial-and-error tests. This is the high-cost way of learning facts. The low-cost way is by intelligent small-scale experiments. Smaller firms make an error if they sit on their hands while the big firms are building up a body of valuable information.

A little-known business principle that makes for success is that you must know two businesses: your own and your customer's. That knowledge contributes to selling success. But if you know three businesses: your own, your customer's and your supplier's, that last item contributes to buying success as well as selling success.

Most food manufacturers blithely ignore learning their supplier's business. The things the latter needs to know, in order to better satisfy the food manufacturer, are the specifications mentioned earlier in this comment. This is where better liaison should be developed and it is up to the food manufacturer to take the initiative.

Index for 1945 Free

NOW is the time to order your copy of the index to 1945 volume of Food Industries. Address the Editorial Department.

It is free to those who ask for it. The supply is, however, limited.

Food Is Way Down the List

AN economist has figured out the percentage of labor cost that goes into the value of products of various industries in order to publish what the demanded 30 percent wage increases may do in the reconversion period. Highest labor cost is, of course, in coal mining where it is much higher than 50 per cent. Steel comes next at 40 to 50 percent. In the 30 to 40 percent bracket comes agricultural machinery, automobile, textiles, machine tools. Chemicals, glass and rubber goods come in the 25 to 30 percent group. Machinery and petroleum products production come between 20 and 25 percent, while below 20 percent are found: cement, cigarettes, paint, soap, distilled liquor and manufactured food.

The leverage exerted on food costs by an increase in its labor costs is probably as small as can be found, but, if food costs go up, it is almost certain to touch off a series of demands in all other industries, because workers in all industries patronize the food industry, and food is an important part of the cost of living.

Stupid Food Law Violations

THERE must be a lot of newcomers in the food industry, judging by the number of seizures for stupid violations of the food law. Or is it possible that there are some misguided souls who take a chance that they will get by?

How are these for examples of stupidity:

A package filled to only 62 percent of its volume?

Ground cocoa shells in powdered cocoa?

Sugar sirup added to maple sirup that was labelled: "100% Grade-A Pure Vermont Maple Syrup"?

Labelling a product "80% Cottonseed and Corn Oils, 20% Pure Olive Oil" when it contained no olive oil?

If anybody in the food industry has any doubts about the propriety of his labels, let him read the law and the regulations. If that is not enough, let him confer with the proper officials. It's cheaper to confer before rather than after a seizure!

Support This Bill

COST of construction of liquid waste disposal plants can be charged to operating expense by corporations if H. R. 3972 is enacted. The bill, introduced by Representative Bailey, would amend Section 32 of the Internal Revenue Code to foster the construction of private waste-disposal plants by permitting the amount paid out, including cost of plans, to be deducted in full from income instead of merely the depreciation thereon, provided the facilities are approved by the appropriate authorities having jurisdiction over stream pollution.

This bill deserves support from the food industry. It not only would provide work during the coming years, it also would make it possible for many a manufacturer to solve a troublesome waste-disposal problem for a minimum of cost.

Research for the Small Company

RESEARCH is in the air today. Newspapers are full of it. Congress debates it. Many a large company is profiting mightily from it. But, alas, many a medium and small company is having its troubles with research, either failing to win the desired profits from research or lacking the requisite know-how to make a suitable start on a research program. The latter appears to be the problem of most of those who are thinking but not yet acting on the need for research.

A successful research program needs at its outset a proper attitude on the part of top management. That's where research should start. It needs a top management that knows what it wants in clearly stated objectives. The objectives should be something new, better, or different. Top management must do its own thinking before starting a research program. Carefully considered decisions must be reached as to what objectives would be profitable or helpful if attained.

If waiting for some outsider like a machinery maker or packaging supplier to come around with something new is the quaint idea of "progress" around the front office, such a firm is lacking in initiative and is likely to find itself in a very vulnerable position. Given two competitive concerns of equal size and markets, the one that thinks up what it wants or needs, and then goes after it, will soon outdistance the other which waits for some one to come in and sell it an improvement. It really is striking to note the numbers of companies that have been bought out by aggressive competitors when the seller is one of those whose idea of progress has been to hope that someone will not only supply its needs, but also discover what these needs are.

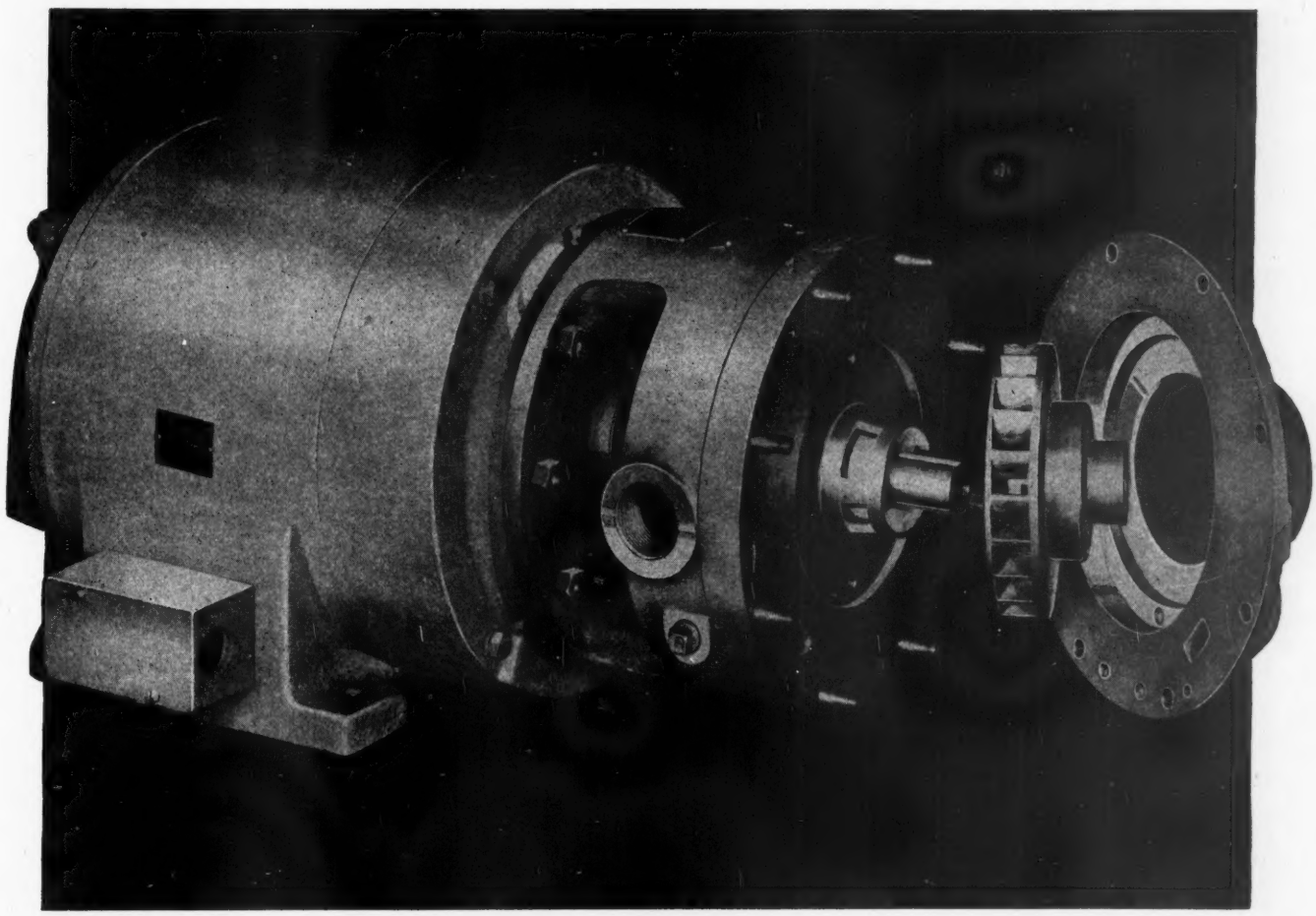
Research in its lesser aspects is nothing more than looking for something that the company wants. If it does not want anything, then there is no point in research. In fact, no more point than putting in a carpenter shop and hiring a carpenter unless the company needs some carpenter work done. Who decides what carpentering should be done? Is it the management? Or is it some unemployed carpenter?

How is research done? As a rule the procedure is to hire a man who has been educated to do this sort of job. Yet it must never be forgotten that some of the best research men got that way because of their natural aptitudes without the benefit of research training. Thomas A. Edison was one. But there are very few Edisons.

Training in how to do research is not indispensible, but such training is useful, and as a rule it insures lower cost of carrying out the investigations ordered by the company. If you ever have had to wait while some ham mechanic went over your car to find out what was the matter with it, and then had to have it towed to another shop where a skilled mechanic got down to the heart of the trouble in ten minutes, you will realize the difference between trained and untrained men in their conduct of an investigation.

Top management, where there is no research department, must grasp the basic idea that it is up to them. They need to develop a healthy dissatisfaction with their current ways, their present equipment, their current products. Then they need to decide what they wish they had in the way of things or ideas that cannot be purchased in the open market. They will then have made the first step toward successful research and a more successful future.

The Nash Clean-Air Compressor has but one simple moving part.



The Nash Clean-Air Compressor has but one moving part, cast in one piece and rotating in the pump casing without metallic contact. No internal lubrication is necessary; therefore air or other gas compressed with a Nash is entirely free from oil contamination.

Dust and heat are removed from the air, or gas compressed, by the unique Nash "Liquid Piston". Air from a Nash Compressor is therefore delivered free from dust, heat, or oil, without supplementary filters or air washers, in a perfected mechanical structure with no internal wearing parts.

Air or gas from a Nash Compressor may be used for agitating, blending, maintaining pressure on storage tanks, or moving liquids and materials by pressure displacement, in connection with the most delicate food, beverage, or chemical process, without danger of contamination.

Bulletin D-252 tells all about Nash Clean-Air Compressors, and it is free on request.

THE NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

NEW PACKAGES & PRODUCTS

Before and After

TRANSITION from the old to the new is brought directly to the public eye by a "two-faced" package that is both original and practical. The housewife, in familiarizing herself with a new label, will know that she is buying a time-tested product.

To celebrate its 50th Anniversary, Post Products Division of General Foods Corp., New York, has put its entire cereal family into boxes of like color and design. The faces and panels of the folding chipboard cartons are done in the new red, white and blue motif while the backs still carry their old labels. The change is noted on one side by solid red and blue arrows pointing to the "before" and "after." Grape-Nuts Wheat-Meal uses a plain chipboard carton with printed paper overwrap.

Post Toasties has undergone a slight name change—it is now Post's Corn Toasties and has been enhanced in flavor and texture.

The variety package known as Post-Tens is back on the market in its new wrap after an absence of more than two years due to federal paperboard restrictions. The assortment includes 1 oz. individual servings of each of the Post cereals and a 2 oz. container of Nabisco Shredded Wheat. Raisin Bran, a combination of bran flakes and raisins, is a recent addition to the line.

A folding chipboard carton with open ends protects the smaller packages and is also designed in the new red, white and blue Post theme. Net weight is 11 oz.

Brazilian Mandarines

BRAZIL may prove to be a source of canned mandarines very much like those which, before the war, came from Japan. A limited supply has been packed for Catz American Co., Inc., New York, under the company's C.A.C. Brand. The mandarines are in a light sirup in a 13½-oz. tin labeled in blue on white with orange-colored fruit slices.

Precooked

AMONG the quick frozen precooked products that are now making their appearance on the market is a Salmon Creole Dinner packed by Whiz Fish Products Co., Seattle, Wash.

Heating is all that is necessary to make the "meal" ready for the table. Ingredients include fresh salmon, peas, tomato puree, celery, onions, shortening, flour, sugar, vinegar, salt and spices.

Packed under the Whiz Brand, the container is of wax-coated chipboard with a double heat-sealed cellophane liner. Net weight is 15 oz.

The company expects to be producing seafood and shrimp creole dinners next month and contemplates oyster stew and seafoods a la king for the near future.

Pretzels in Tin

METAL containers are beginning to reappear on the grocery and specialty shelves after an absence of two or three years due to wartime restrictions. Baked goods particularly have suffered under makeshift packages.

Bachman Bakeries, Inc., Reading, Pa., is one of the first to revert to prewar standards, having put its pretzels into attractive tins that are suitable for storage purposes when empty.

The Hostess Tin, designed chiefly as a gift package, has a hand-packed assortment of crisp pretzel sticks, stars and twists—individual paper bags hold the larger ones. This item is being used extensively by business organizations in and around Reading as a token to clients in recognition of "The Pretzel City."

The standard size grocery store pretzel has been jumble-packed in a deep container of similar design.

Bachman uses a simple but distinctive red and yellow decor for all of its packages.

Quick Cream Sauce

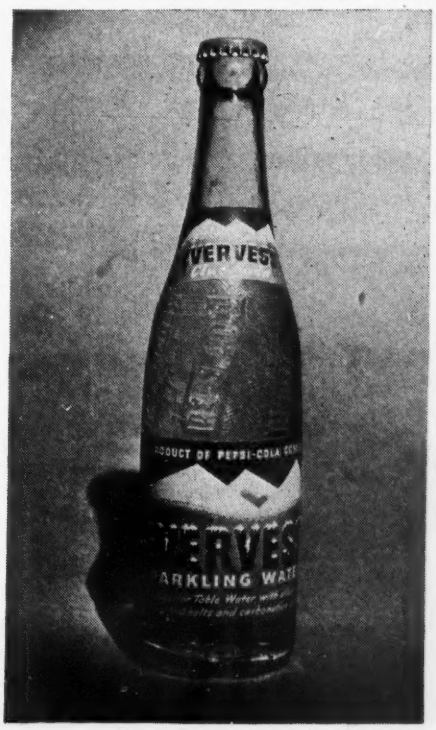
THE housewife who runs into difficulty when she tries to make cream sauce will find that her burden has been lightened by the Butterich Cream Products Corp., Boston, Mass.

The company has put the wheat flour, milk, butterfat solids, salt and artificial color into a screw-cap jar so all that is required is to add about 3 cups of water, bring to a boil and season. The mixture is suitable for custards, lemon pie filling, a la kings or hot fudge sauce.

The 6½ oz. container provides 8 to 10 servings.

Fizz Water

A SPARKLING WATER that has flowed through ultraviolet rays during processing is the result of two years of research by the Pepsi-Cola Bottling Co., New York. The product, called Evervess, is a clear water with al-



No More $TONE$ in Your Bottle-Neck!

• Now, with critical war shortage of labor, streamline STONING in your mill. Removing stones has always been slow, laborious and costly out of proportion to other steps in processing cereals, soy beans, and other dry foods. To eliminate this great headache of the cereal and other dry food processors, we have developed a new type stoner—revolutionary in design, amazing in efficiency, low in first cost, in operation. Removes stones, glass, non-magnetic as well as magnetic metals, and all other hard, dangerous contaminations from cereals, soybeans, and other beans, and other food products with, 1) an action so sensitive the tiniest particles are easily removed; and 2) operating cost so low it is relatively insignificant; and 3) 99.9% efficiency. Capacity up to 16 tons per hour.

Write for Bulletin FI-246

SUTTON, STEELE & STEELE, INC.
DALLAS, TEXAS
In Canada—Kip Kelly, Ltd., 68 Higgins Ave., Winnipeg
Foreign—Separations Engineering, Ltd., 133 Bush House, Aldwych, London

GIVE YOUR CARTON THE *Final* SELLING PUNCH!

The acid test of any carton is its *Selling Punch*—
a combination of distinctiveness and
attractiveness that literally shouts "Buy Me!"
A. C. M. Clay Coated Cartons give you
maximum Selling Punch. Their pure white,
velvet-smooth surface, produced
by an exclusive, continuous process, enhances
any design and assures brilliant, colorful
reproduction in either letterpress or lithography.
A. C. M. Clay Coated Cartons
protect and *sell* your product better.

AMERICAN COATING MILLS, INC.
Main Offices and Plants—Elkhart, Indiana.
Branch Plant—Chicago.
Branch Sales Offices—Wrigley Bldg., Chicago;
271 Madison Ave., New York City.
Subsidiary—Modern Packages, Inc., Memphis, Tenn.

WHY A. C. M. CARTONS ARE BEST:

Whiter board—
velvet-smooth surface—more rigid—
tougher—better folding qualities—
greater luster and brilliance—
perfect reproduction in either letter-
press or lithography.

The Secret is in the SURFACE

AMERICAN COATING MILLS

A.C.M. CLAY COATED CARTONS AND CARTON BOARD

kaline and neutral salts and carbonation added.

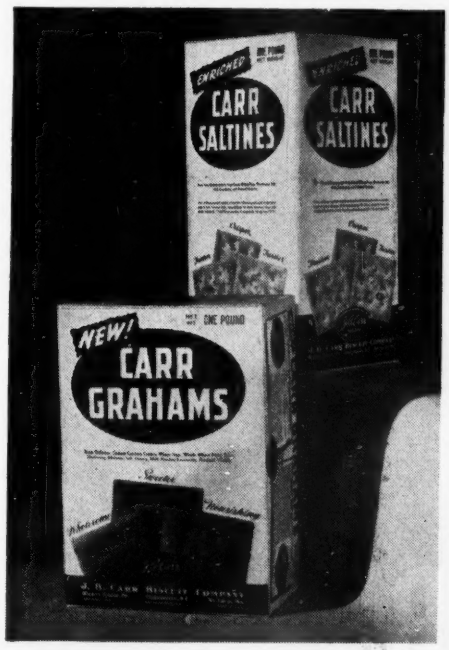
The Pepsi-Cola private-mold bottle is used with a label and cap done in two shades of blue and white, an iceberg motif presenting a frosty effect.

The 12 oz. bottle is distributed through regular trade channels in the New York area.

Wrapped for Traffic

THE trend in package redesign for bakery products continues to take a step forward. This is evident by the introduction of bright wraps for traffic items of the J. B. Carr Biscuit Co., Wilkes-Barre, Pa.

Carr Saltines are in a standard set-up carton with both inner and outer waxed paper protection and a six-color lithographed overwrap. The



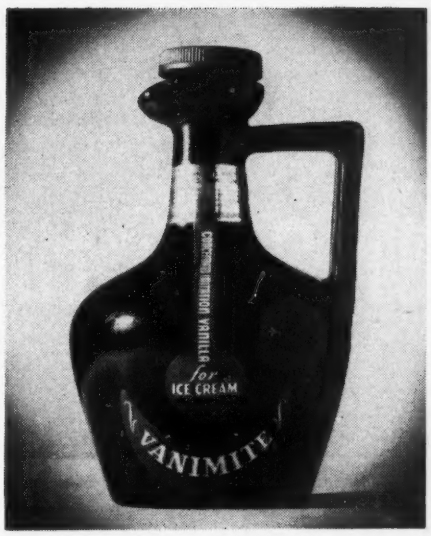
Grahams are packed in a like manner, but do not have the outer waxed paper covering. Each of the items features a group of 12 or 16 recipes, using 3 or 4 to a package.

Carr Vanilla Wafers, temporarily off the market due to the sugar shortage, have been treated similarly with the exception of the predominating colors which are buff and brown instead of white, red and blue.

Flavor by the Gallon

A CONCENTRATED imitation vanilla for ice cream manufacture has been developed by Balch Flavor Co., Pittsburgh, Pa.

With the addition of water, the contents of a one pint jug of Vanimite makes a gallon of single-strength vanilla. One half oz. of the



reduced vanilla is needed for each gallon of ice cream mix.

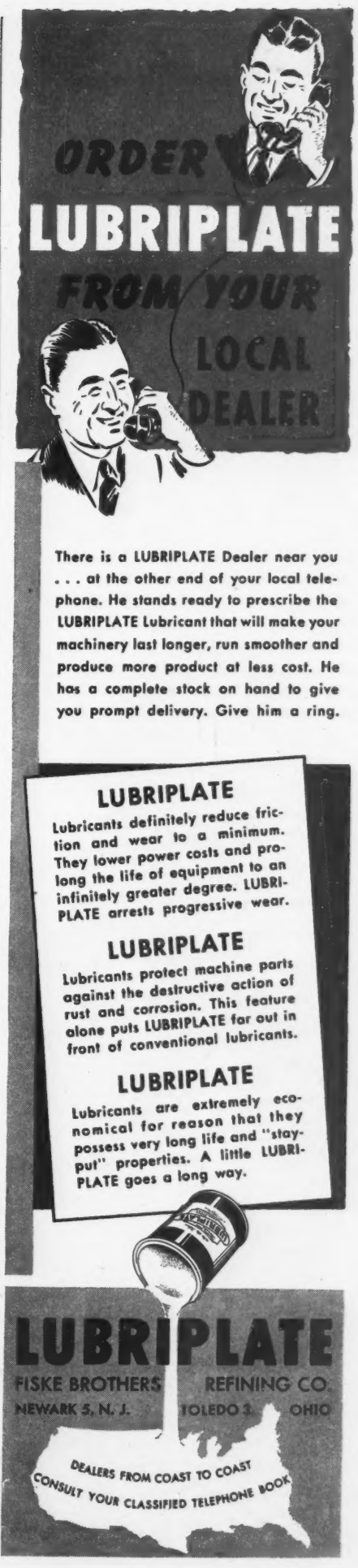
Ingredients include propylene glycol, glycerin, vanilla bean extractives, alcohol and U. S. certified color.

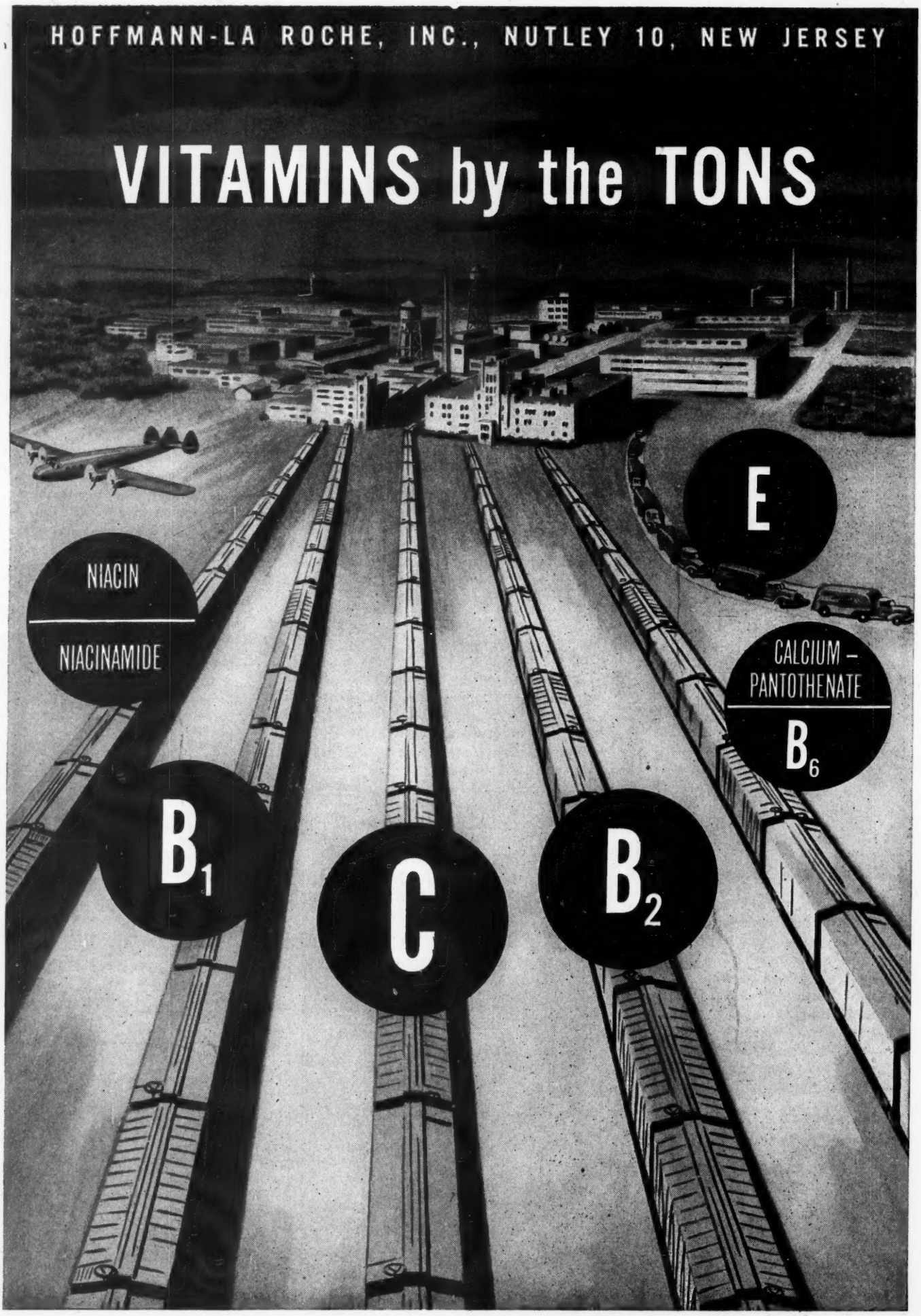
Attractively packaged in a black stone jug, the label is marked by its simplicity. The cork has a red wooden top with knurled sides and raised white lettering. A plastic sealing band protects the mouth of the jug.

Farm-style Relish

GREEN TOMATOES, sweet red and green peppers, onions, salt, sugar, cider vinegar, mustard seed and spices constitute a Farm Style Chili Sauce Relish comparable to the kind mother used to make.

It is packed in a vacuum-sealed glass jar under the Ritter label by P. J. Ritter Co., Bridgeton, N. J. The label is simple, allowing a clear view of the full-colored contents of the jar. Something novel in ingredient lists appears on the back—the items are written out in longhand.


ORDER
LUBRIPLATE
FROM YOUR
LOCAL
DEALER
There is a LUBRIPLATE Dealer near you . . . at the other end of your local telephone. He stands ready to prescribe the LUBRIPLATE Lubricant that will make your machinery last longer, run smoother and produce more product at less cost. He has a complete stock on hand to give you prompt delivery. Give him a ring.
LUBRIPLATE
Lubricants definitely reduce friction and wear to a minimum. They lower power costs and prolong the life of equipment to an infinitely greater degree. LUBRIPLATE arrests progressive wear.
LUBRIPLATE
Lubricants protect machine parts against the destructive action of rust and corrosion. This feature alone puts LUBRIPLATE far out in front of conventional lubricants.
LUBRIPLATE
Lubricants are extremely economical for reason that they possess very long life and "stay-put" properties. A little LUBRIPLATE goes a long way.
LUBRIPLATE
FISKE BROTHERS REFINING CO.
NEWARK 5, N. J. TOLEDO 3, OHIO
DEALERS FROM COAST TO COAST
CONSULT YOUR CLASSIFIED TELEPHONE BOOK


HOFFMANN-LA ROCHE, INC., NUTLEY 10, NEW JERSEY
VITAMINS by the TONS
NIACIN
NIACINAMIDE
E
CALCIUM –
PANTOTHENATE
B6
B1
C
B2

FOOD INDUSTRY NEWS

GENERAL

Processing Gets Spotlight At Coming IFT Convention

Tentative program for annual meeting in Buffalo, March 17-20, gives special sessions to dairy and frozen food problems

QUALITY and flavor control, processing operations and methods, sanitation, high frequency heating, and new nutritional developments are to be emphasized in the program for the sixth conference of the Institute of Food Technologists to be held March 18, 19 and 20 at the Statler Hotel, Buffalo, N. Y.

In all, the program for the three-day meeting will consist of eight technical sessions, one luncheon and one banquet session. It is planned to inform those engaged in the processing, packaging, handling, shipping, and storage of food products, on technical developments during the war and, as far as practical, project the potential application of the developments into peacetime practice.

A total of 37 papers on the broad scope of food technology has been scheduled for the six technical sessions. In addition, an afternoon session is planned for those primarily interested in milk processing problems. Another afternoon session will be devoted to frozen foods.

Addresses on subjects of international importance will be made at the Monday luncheon and Tuesday banquet sessions. A highlight of the banquet session will be the presentation of the Nicholas Appert Medal Award given by the Chicago section for "pre-eminence in and contributions to the field of food technology."

The authors of the scheduled papers are recognized authorities in the field of food technology and the contents of these papers will be of timely value to food chemists, research workers, physicists, biologists, production executives, nutritionists and even sales managers who have an eye to the future, with respect to the impact of technological developments on the marketing of foods.

An Industrial Exhibits Committee, under the Chairmanship of John Fix, American Can Co., Rochester, N. Y., is arranging for an equipment and supplies showing in keeping with the program for the technical session. These exhibits are to open Sunday, March 17, and continue throughout the meeting. Space for 100 exhibits has been made available.

Another USDA Shakeup Appears in the Wind

MORALE in the Department of Agriculture is at a low ebb and rumors of impending changes are heard on all sides. These run the entire gamut from minor reorganizations within individual bureaus to the resignation of Secretary Anderson and the complete reorganization of the department which would follow.

A few facts are available. The smooth-running organization envisioned by the secretary when he took over last July has not materialized. The establishment of the Production and Marketing Administration in which about half of the bureaus of the department were transferred was a mistake. No administrator has yet been found who can handle all three principal functions—banking, agricultural production and distribution—now being carried on in PMA. The situation is too much for even the capable Jack Hutson.

Career men in the department see nothing ahead but a series of reorganizations. The stage at which these men are openly expressing their dissatisfaction has passed. Some have already found new positions outside of government. Others are expected to leave as soon as they find new berths. Full impact of this movement will not be felt until present top administrators retire from service some five or ten years hence. Trained personnel may not be available at that time if the recent trend continues.

The problem of the secretary is greater because of the residual personnel of previous administrations who do not think alike and can scarcely be expected to pull together as a team. There is the pre-New Deal group, Henry Wallace's left-wingers, the Wickard-Jones crowd, and the men Mr. Anderson brought with him. Lack of cooperation between these groups is marked.

Result is a do-nothing attitude among the capable men in the department who could help the secre-

ARMY CITES ARMY

Q.M.C. Subsistence Research and Development Laboratory, Chicago, receives the War Department Service Award of Merit for its contribution to the feeding of the armed forces in all World War II training and combat areas. Col. Rohland A. Isker, commanding officer, is seen here accepting the commemorating plaque for the laboratory from Brig. Gen. Georges F. Doriot, director, Military Planning Division, Office of Quartermaster General. The others representing the laboratory personnel are Lt. Col. Jesse H. White (retired), Capt. Walter A. Maclinn, and Lt. Col. Don L. Deane.

tary. From a practical view, this can be far more deadly than active opposition to the secretary.

Secretary Anderson can help himself to some extent if he is able to stay in Washington long enough to make necessary administrative decisions. Heretofore, he frequently has been absent on official business, such as the Quebec conference at which FAO was established and the many speaking tours which come under the head of political business.

Washington observers expect the crisis to be reached soon.

Colonel Isker Gets Legion of Merit Award

COL. ROHLAND A. ISKER, Commanding Officer of the Q.M.C. Subsistence Research and Development Laboratory, Chicago, since 1939, received the Legion of Merit citation in recognition of his work in organizing the laboratory and expanding its functions and scope from a staff of four to one requiring the services of 45 officers and 200 civilians. He also supervised the improvement and development of rations for the Armed Forces to make them the best fed combatants engaged in World War II.

Previous recognition of Colonel Isker's war work is the honorary degree of Doctor of Science conferred upon him by the University of Maine in June, 1945.

In addition to directing subsistence research work, Colonel Isker is also Commandant of the Q.M.C. Subsistence School, Chicago, where officers of all branches of the Armed Forces are trained in the handling and preparation of subsistence. He is also Chief of the Subsistence Section, Research and Development Branch, Military Planning Division, Office of the Quartermaster General, Washington, D. C.

Cereal Report Based On Consumer Studies

A REPORT on the cereal industry in the United States, covering consumer studies made by the Department of Commerce, Department of Agriculture, the Nielsen Food Index and an Elmo Roper study made in 1943 on the habits and use of cereals by the American public, has been prepared by Cereal Institute, Inc., 135 So. La Salle St., Chicago.

The report covers such topics as consumption, distribution, popularity of types, classification, seasonal demand, package size and selling price, new products, food value and merchandising.

Borden Plans Outlay For Needed Equipment

EXPENDITURES of approximately $23,000,000 in the coming year are anticipated by the Borden Company for extension and improvement of equipment and properties.

Although the company faces no major problems of plant reconversion as a result of the war, it was called upon to make huge increases in production during the war years to meet military and lend-lease requirements, as well as civilian needs. Most of these increases had to be achieved with existing equipment and plant facilities temporarily adapted to the purpose.

The requirements of the company are varied as to items and localities in which needed. The major ones are motor vehicles of all types, processing machinery, and refrigerating equipment. The need for replacements exists in all territories in which the company operates plants and embraces all product groups.

The sum of $23,000,000 represents a sharp increase over the company's average annual expenditures for such purposes and reflects in part increased costs in material, as well as the extensiveness of replacements required. They hope to complete most of the projects in 1946.

Kitchen Resigns

C. W. KITCHEN, assistant administrator, regulatory and market service work, Production and Marketing Administration, U. S. Department of Agriculture, has resigned to become executive vice-president of United Fresh Fruit and Vegetable Association, left vacant by the recent death of William Garsitt.

TENTATIVE PROGRAM

Institute of Food Technologists

Sixth Annual Meeting

Hotel Statler, Buffalo, N. Y. • March 17, 18, 19, 20, 1946

March 17, 9:30 A.M.

Meeting of Council.

7:30 P.M.

Discussion: Training of Food Technologists.

March 18, A.M.

Quality Control Session.
1. What Is Quality.
2. The Selection and Handling of Raw Materials Intended for Processing in Relation to Product Quality.
3. Bacteriology in Food Processing.
4. Objective Measurements of Quality in Canned Foods.
5. Improving Food Quality.
6. Basic Chemical Reactions in Food Deterioration and Their Control.
7. Enzyme Control and Recent Developments in the Food Industry.

P.M.

Operations Session.
1. High-Short Processing of Fruit and Vegetable Beverage Product.
2. Line Operation Design for the Food Industry.
3. Cost Determination and Allocation in Food Manufacturing Operations.
4. Corrosion Problems in the Food Industry.
5. Peeling Operations.
6. Materials Handling in the Food Industry.

P.M.

Flavor and Flavor Control Session.
1. Food Acceptability — Its Determination and Evaluation.
2. Salt and Its Place in the Food Industry.
3. Sugars and Their Place in the Food Industry.
4. The Role of Anti-oxidants in Flavor Problems.
5. Flavor—Its Role and Control in the Food Industry.

Evening

Smoker and Entertainment.

March 19, A.M.

Sanitation Session.
1. Regulatory Aspects of Sanitation.
2. DDT and Other Recent Insecticides.
3. Air Sanitation in Food Plants.
4. Rodent Control and "1080."
5. Significance of Bacterial Growth Curves in Food Plant Control.
6. Detergents—Their Utilization in Food Plants.
7. Waste Disposal in Food Plants.

P.M.

Electronics Session.
1. The Basic Theory and Tools of High Frequency Heating.
2. The Present Applications and Limitations of Electronic Control and High Frequency Heating in the Food Industry.
3. Applications in the Baking Field.
4. Applications in the Blanching of Foods.
5. Infra-red Irradiation and Its Place in Food Operations.
6. Fluorescence and Its Uses in the Food Industry.

P.M.

Dairy Session.
1. The Use of the Vacreator in the Dairy Field.
2. Work Simplification in the Dairy Field.
3. Disposal of Dairy Wastes.
4. New Types of Stabilizers and Emulsifying Agents in Ice Cream.
5. Our Newer Knowledge Regarding the Manufacture of Powdered Whole Milk.
6. Planning for Greater Efficiency in the Operation of Dairy Plants.
7. Use of the Direct Microscopic Count as a Control Measure in Dairy Plants.
8. Mechanism of Autoxidation Reaction in Fat.

Evening

Banquet Session.
Award of Nicholas Appert Medal.

March 20, A.M.

Nutrition Session.
1. Food Processing and Its Significance in Human Protein and Vitamin Needs.
2. Amino Acid Composition of Foods.
3. Protein Hydrolysates and Their Future Functions.
4. Unsolved Army Nutrition Problems.
5. Recent Advances in Nutrition Analytical Methods.
6. Establishing a Nutrition Laboratory in a Food Plant: Needs, Facilities, Personnel.

P.M.

Frozen Foods Session.
1. Problems in Pre-Cooked Frozen Foods Production.
2. Frozen Foods—Research, Economics and Future.
3. Quality Control in Frozen Foods.
4. Frozen Poultry.
5. Development in Rail, Air and Ship Transportation of Frozen Foods and Raw Perishables.
6. Frozen Foods Packaging.

Planned IN THE DOBECKMUN LABORATORIES

This moisture-vapor-proof package successfully retains original 40% moisture content required for growth and 9 month life of enclosed bacteria. Also inhibits attack on package by these bacteria. Only Metalam could meet these two difficult requirements of Kalo Inoculant Company, Quincy, Illinois.

Dobeckmun creative service developed this Metalam package, made of pure sheet aluminum supported by acetate film. For dehydrated fruits or foods, pharmaceuticals or chemicals . . . in fact, for any product whose moisture content must remain fixed, heat-sealing Metalam gives permanent, positive protection. (Often supplied in rolls for automatic packaging.) Multicolor printing on the film adds the attractive sparkle that leads to sales. The Dobeckmun Company, Cleveland 1, Ohio. Branches at Boston, Chicago, Cincinnati, Los Angeles, New York, Philadelphia, San Francisco and Seattle. Representatives everywhere.

DOBECKMUN

Self-selling packages in processed films and foils

ASK US FOR SUGGESTIONS ON PROBLEM PRODUCTS

The gum wrapping machines have conveyors for the cartons in which the gum is packed. One belt delivers empty cartons to the packers; the other carries filled cartons to the FA wrapping machines which wrap them in printed wrappers.

Courtesy American Chicle Company

Where Packaging Efficiency must be at its HIGHEST...

...there you will find machines of the Package Machinery Company at work

Manufacturers whose products must sell at popular, standardized prices, have to employ packaging machinery that cuts costs to the bone. And yet the wrapping must be highly protective as well as attractive and of utmost convenience to the user.

The Dentyne wrapping machines, illustrated above, are an excellent example of how our modern machines meet these requirements.

Each unit in this line-up does a complete wrapping job. Gum is fed into the wrapping machines in the form of scored strips. The machine cuts these strips into individual pieces of gum and wraps hundreds of pieces per minute in printed waxed paper, the printing being registered by electric eye. It then assembles the wrapped pieces in groups of six, wraps each group in wax-backed foil, and inserts an easy-opening tape. The end-folds, seam and notch where the tape protrudes, are sealed by liquid wax to keep the gum fresh and tender. Finally, the printed paper band is glued around the package, with the design accurately located by electric eye. Two of our FA machines, located at the end of the line, wrap the cartons in which the gum is packed.

We'll help you lower costs

We'll be glad to make a survey of your present methods and equipment with a view to giving you faster, more economical wrapping—and a better, more attractive package.

Write for our booklet "Sales Winning Packages"

PACKAGE MACHINERY COMPANY, Springfield 7, Massachusetts

30 Church St., New York 7 • 111 W. Washington St., Chicago 2
101 W. Prospect Ave., Cleveland 15 • 443 S. San Pedro St., Los Angeles 13
18 Dickens Ave., Toronto 8

PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

Pay to Meat Packers Higher Than in 1944

AVERAGE weekly earnings, including overtime, of workers in the meat packing industry have been among the highest for all industry since the postwar period set in, declares the American Meat Institute. Using the latest available reports of the bureau of labor statistics, the Institute shows that during September, 1945, packing-house workers averaged $45.81 weekly compared with an average of $40.86 for all manufacturing industries and with $39.34 for all food manufacturing.

Employment in the meat packing industry and take-home wages have not been affected materially by the ending of hostilities. In fact, the average hourly earnings are greater now than at any time during 1944.

Nutrition Foundation Broadens Its Research

THE Nutrition Foundation, now entering its fifth year of public service, has made allocations of $1,047,755 for fundamental studies in nutrition since it was first organized, George A. Sloan, President of the Foundation, recently announced.

Thus far, $2,152,500 has been contributed by food manufacturers, Mr. Sloan said, to carry on an unrestricted program of research to advance the knowledge of nutrition.

The Foundation develops its program through grants-in-aid to established institutions of research. It has made 111 grants to date, to 46 universities and medical centers in the United States and Canada.

One of the most far-reaching contributions made by the Nutrition Foundation, according to Mr. Sloan, was the establishment, for the first time, of the human adult requirements of the essential amino acids common to protein foods. This information is basic to a modern appraisal of the value of protein foods and will also be valuable to the medical profession in regard to intravenous feeding and the use of hydrolysates.

"When one stops to consider that there are almost 3,000,000 infants born every year in the United States and that, based on recent studies, the prospect of an infant's being in robust health is four times greater when the mother's diet has been good, a better appreciation can be had of the importance of the new basic information regarding the nutritive requirements of infants and mothers," said Mr. Sloan.

The purpose of the Nutrition

Sturtevant Centrifugal Air Separator in closed circuit with Ring-Roll mill.

RECORDS PROVE

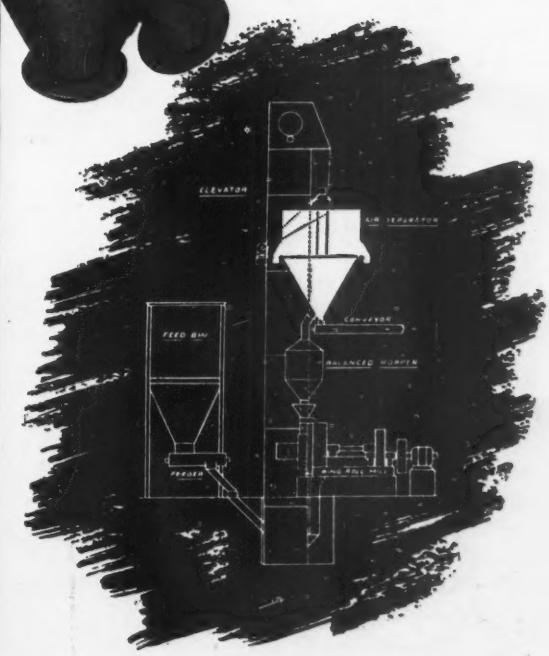
Sturtevant Air Separators

Increase production of accurately sized materials . . . reduce separating costs of sizings from 40 to 350 mesh

When requirements call for a continuously uniform product of any desired fineness from 40 to 350 mesh, use Sturtevant Air Separators. These highly efficient separators will increase output of accurately sized materials by as much as 300%. In addition, they reduce power costs up to 50%.

Hundreds of installations in practically every type of industry prove that Sturtevant Centrifugal Air Separators are more economical to use because their efficient operation assures finer separation of fine materials with the result that uniform quality is always obtained.

They are available in sizes from 3 to 16 feet in diameter with capacities from ¼ to 50 tons per hour. Get the entire story. Write for Bulletin 087 today.



STURTEVANT
MILL COMPANY
84 Harrison Square, Boston 22, Mass.

Designers and Builders of

CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • ELEVATORS • LABORATORY EQUIPMENT • MECHANICAL DENS AND EXCAVATORS • MIXERS

SELECT FROM THIS SYSTEM OF

14

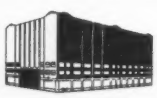
COLD STORAGE

WAREHOUSES

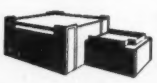
TO HELP PROTECT YOUR

FROZEN FOODS

For expert, economical handling of frozen foods use these 14 strategically situated warehouses . . . each ideally located in one of the large buying centers . . . each providing outstanding facilities for the fast handling and proper storage of frozen foods. Contact your nearest City Ice Warehouse for a copy of the new, illustrated "Tariff & Directory."



JERSEY CITY, N. J.
Seaboard Terminal & Refrigeration Co.



HORNELL, N. Y.
The City Ice & Fuel Company

PITTSBURGH, PENNA.
Federal Cold Storage Co.

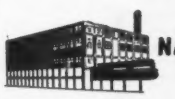
CLEVELAND, OHIO
Federal Cold Storage Co.

COLUMBUS, OHIO
Federal Cold Storage Co.

DECATUR, ILL.
Polar Service Company

ST. LOUIS, MO.
Federal Cold Storage Co.

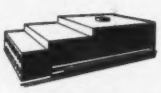
ST. LOUIS, MO.
Mound City Ice & Cold Storage Co.



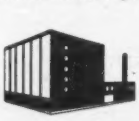
NATIONAL STOCK YARDS, ILL.
North American Cold Storage

SPRINGFIELD, MO.
Springfield Ice & Refrigerating Co.

KANSAS CITY, KANS.
Federal Cold Storage Company



TULSA, OKLA.
Tulsa Cold Storage Co.



GALVESTON, TEX.
Galveston Ice & Cold Storage Co.

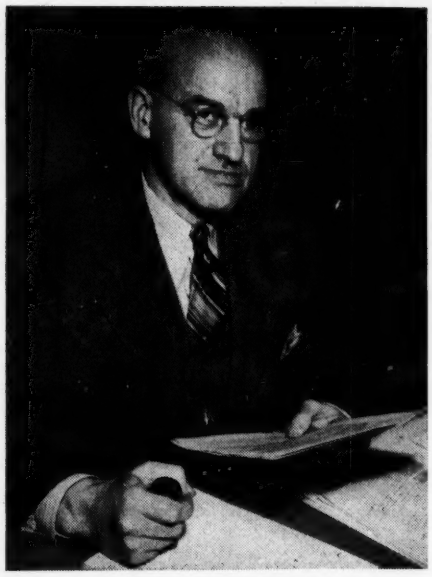
PHOENIX, ARIZ.
Crystal Ice & Cold Storage Co.

THE CITY ICE & FUEL CO.

Cold Storage Division

The CITY ICE & FUEL Company

33 SO. CLARK ST., CHICAGO 3, ILL.



NEW ASSISTANT
M. W. Baker is the new assistant director of the fruit and vegetable branch, Production and Marketing Administration. He is in charge of fresh and processed inspection, market news, and regulatory activities.

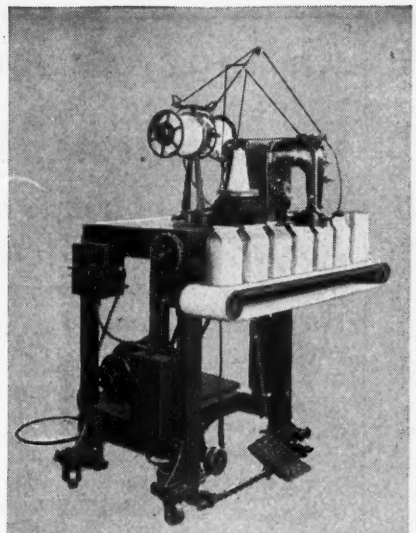
Foundation, as outlined by Mr. Sloan, is to find what quantity of each of the forty or more essential nutrients is essential for good nutrition; how each nutrient functions inside the body; how each can be used to protect human and animal health; and how each can be measured accurately, either as it functions in the body or as it comes into being on a farm and later takes its course through the channels of commerce to the ultimate consumer.

Burry Biscuit Seeks To Increase Capital

COINCIDENT with the issuance of its annual report for the fiscal year ended October 31, revealing record sales and earnings for the period, the Burry Biscuit Corp. asked stockholders to approve, at the annual meeting on February 8, the creation of a 100,000-share issue of $20 par, $1.25 convertible preferred stock and an increase in authorized common stock from 750,000 shares to 1,000,000 shares.

George W. Burry, president, declared, in his remarks to stockholders, that negotiations are under way with an underwriting syndicate to be headed by Van Alstyne, Noel & Co. of New York and Carlton M. Higbie Corp. of Detroit, Mich., for public offering of the preferred stock. Proceeds, he explained, would be used for redemption and retirement of unconverted prior preferred stock, expansion of plant facilities and additions to working capital.

Sales for the fiscal period, the re-



60000 D
Sewing Head

FAST—Keyed to the output of standard filling of weighing equipment.

ECONOMICAL—Uses inexpensive cotton thread and paper tape.

EASY TO OPERATE — Inexperienced help can be trained to operate the machine in a few hours. Light, easy work.

DEPENDABLE—A precision built, quality machine designed for years of service.

SEMI-AUTOMATIC OR AUTOMATIC — For use as one operator machine or as part of completely automatic installation.

VERSATILE — Style 60000 DZ sewing head makes the bound-over tape closure on this range in sizes of filled paper bags.

here's the equipment for producing the

dubl-tape closure

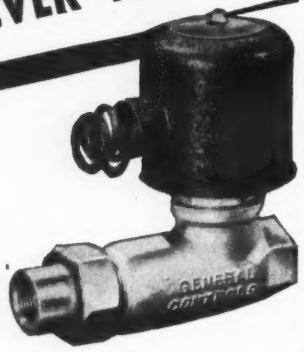
on small paper bags

• Where food products are packaged in paper bags —from 1 lb. to 25 lb. size—the closure should be firm, tight, eye-appealing, inexpensive and easy to open. The ideal closure is the Union Special Dubl-Tape Closure. Producing this closure is the final step in mechanized packaging and can best be done with the Union Special 60000 D sewing head. Mounted on the popular Style 21800 N portable, table-type, bag closing machine, this is considered *essential equipment* by many producers of dry foods. Style 21800 N machine includes a power-driven conveyor adjustable vertically to accommodate different sizes of bags. Control is by floor treadle and the unit may be operated from a sitting position. Write for Bulletin No. 100 on packaging.

Union Special *Bag Closing Machines*

UNION SPECIAL MACHINE COMPANY • 450 N. Franklin St. • Chicago 10, Ill.

UNSURPASSED ELECTRO-MAGNETIC LEVER VALVES



by General Controls

K-10 SERIES

FOR CONTROLLING air, water, gas, steam, light and heavy oils, and refrigerants, etc. Suitable for pressures up to 1,000 pounds and temperatures up to 400° F.

Internal valve assembly can be removed for cleaning and inspection if necessary. Two-wire—A.C. or D.C. —current failure—packless construction—bronze body—stainless steel and bronze internal parts—soft seats available.

SIX TIMES THE POWER of ordinary solenoid valves. This feature assures high seating pressure and overcomes the effect of viscous fluids, such as heavy fuel oil. Adequate power of the solenoid insures positive operation. Available in normally closed or open types.

FOR COMPLETE SPECIFICATIONS on temperature, pressure and flow controls for industrial applications write for new 1946 Catalog 52C or contact Factory Branch or Distributor near you.

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.

FACTORY BRANCHES: PHILADELPHIA • ATLANTA BOSTON • CHICAGO • KANSAS CITY • NEW YORK DALLAS • DENVER • DETROIT • CLEVELAND HOUSTON • SAN FRANCISCO • SEATTLE • PITTSBURGH
DISTRIBUTORS IN PRINCIPAL CITIES

24-3

port disclosed, were at a record high of $8,916,549, up 31.4 percent from the previous year's peak of $6,785,-175. Consolidated net income, after charges and taxes, amounted to $260,965, the highest in the corporation's history and more than 150 percent greater than the $104,385 recorded in the preceding year, equal to 44 cents and 21 cents a share, respectively, on the outstanding common stock after preferred dividends.

Surplus Food Sales Total $68 Million

SALES of government-owned food by the Department of Agriculture totaled $9,061,301 during the month of December, bringing the total of such sales for the calendar year 1945 to $42,792,207. The December sales figure compares with the November total of $17,788,469, and brought to $68,824,376 the total amount of such sales made since May 1, 1944.

Disposal of food declared surplus to the department by other government agencies made up the bulk of the December sales, accounting for $8,877,388. As in November, disposal of butter, previously declared surplus, made up the major portion of declared surplus sales. The December sales of butter amounted to $8,159,656. Other December sales included USDA-owned commodities, items released in regular stock-turnover operations, and inventory reductions, as well as those purchased originally in price-support operations.

Carr Bakers Get New Wage Contract in Pa.

MORE than 700 employees at the Wilkes-Barre, Pa., baking plant of the J. B. Carr Biscuit Co. were granted a 7 percent wage increase, effective January 2, on top of one for 5 percent retroactive to July 26, 1945, under the terms of a new contract signed by the company with the Bakery and Confectionery Workers International Union of America, A. F. of L., it was announced by J. B. Carr, president.

To be in effect until July 26, 1947 the contract also grants wage increases in several employment classifications to correct inequalities of compensation between jobs. Moreover, it provides for payment of time and one-half for all hours in excess of 40 weekly and for all hours worked on Saturday, with double time for all Sunday work. Employees with the company three years or more will receive two weeks' vacation with pay, while those with one to

An Independent
• Laboratory
to meet the needs of your Organization

WE are eager to have your firm as one of our many clients and will be glad to advise you (without obligation on your part) as to how we can assist you in many matters requiring the work of an independent laboratory of established reputation and broad experience.

Food Analysis
VITAMIN DETERMINATION
Biological
Microbiological
Chemical
NUTRITIONAL STUDIES—RESEARCH
PRODUCT DEVELOPMENT
BACTERIOLOGICAL STUDIES
CONSULTATION
Labelling
Advertising

LEBERCO LABORATORIES
36 Roosevelt Avenue, Bloomfield, N. J.

ATTENTION MANUFACTURERS !

If you have rats or mice, and want to be rid of them without the worry that the use of poison involves, send your order at once.

We have prepared a bait that contains red squill, a drug from the Mediterranean which is harmless to humans, cats, or dogs, but has the special qualities that mean *DEATH TO THESE RODENTS.*

Our R. C. Baits, baked in cookie form, are readily eaten by rats and mice, and have been used successfully with great satisfaction. All you do is scatter our R. C. Baits in infested areas.

No. D 1501— 100 baits—$4.00
No. D 1502— 250 baits— 7.50
No. D 1503— 500 baits—12.50
No. D 1504—1000 baits—20.00

"It's worth the price because it does the work without danger to human life."

Your check, or purchase order, will assure you prompt delivery. We pay all shipping charges except on C.O.D. orders.

RODENT CONTROL CO.
220 Broadway, New York 7, N. Y.

In the Walworth line there's a valve for every job, engineered to assure maximum economy of operation and trouble-free performance. Each Walworth valve has ALL the latest features of advanced design that are required for the service for which the valve is recommended.

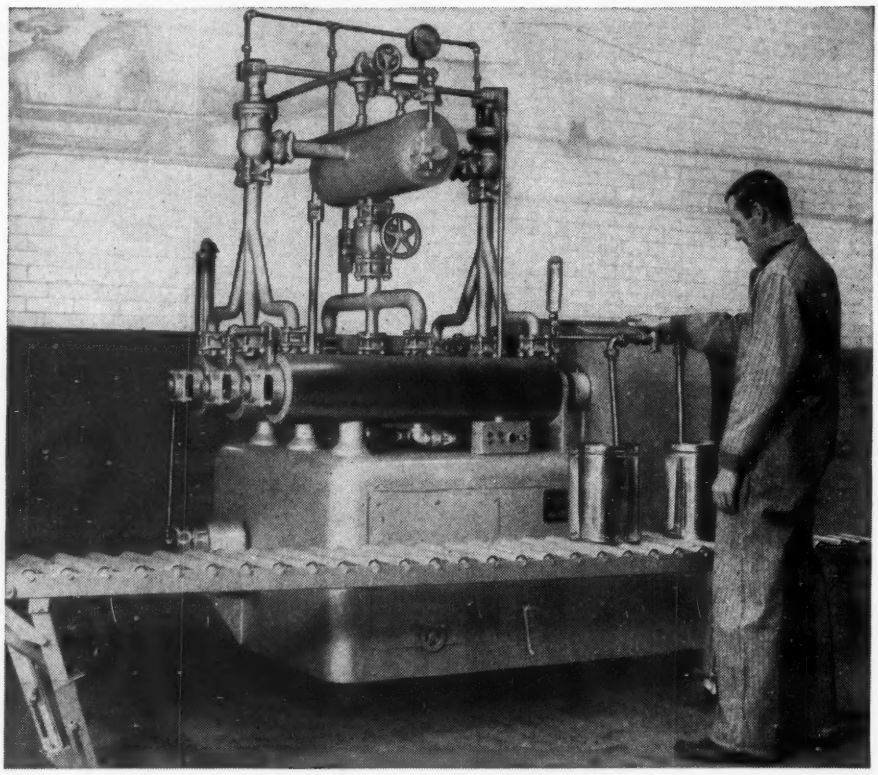
Walworth Catalog 42 gives full information on the Walworth complete line of steel, iron body, bronze and lubricated plug valves, as well as a complete line of fittings. Your copy may be obtained upon request. Write for it today.

Walworth VALVES AND FITTINGS

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

NEW CONTINUOUS, CLOSED METHOD REVOLUTIONIZES FRUIT PUREE FREEZING



BENTON HARBOR, MICHIGAN: At Producers Service Corporation, fresh fruit puree is slush-frozen from 100° to 27° F at the rate of 3600 pounds per hour with the VOTATOR* continuous processing unit. Refrigeration holding time for a solid freeze is cut from twelve hours with —10° to —20° F temperatures to six hours at +8° F.

This new, fast method cuts production cost, especially in regard to the use of refrigeration. And it really retains the natural qualities of fresh fruit, prevents off-flavors, and assures a uniform product. Which, according to Fred L. Granger, President and Sales Manager, has been a major advantage to Producers Service in promoting the sale of frozen fruit products to ice cream manufacturers, preservers, and bakeries. He says, "Our VOTATOR installation paid for itself during the first year of operation."

Strawberries, red and black berries, sour cherries, peaches, apples, concord grapes, and oranges are among the items which have been successfully processed with the VOTATOR for the production of frozen fruit juices, purees, concentrates, and pulps. These represent one department of the VOTATOR's usefulness. Continuous, closed VOTATOR operation holds basic advantages for producers of just about any food product which is processed in a liquid or viscous condition and requires cooling, heating, or both.

Write to The Girdler Corporation, Votator Division, Dept. FI-2, Louisville 1, Kentucky; 150 Broadway, New York 7, N. Y.; 617 Johnston Bldg., Charlotte 2, North Carolina.

THE Votator A GIRDLER PRODUCT

Trade Mark Reg. U. S. Pat. Off.

three years' service will get one week's vacation with pay.

The new contract, which includes those sections of the G. I. Bill of Rights pertaining to re-employment of returned veterans, also grants liberal time allowances, with pay, for rest periods, particularly during the summer months, and sets up arbitration procedure to avoid possible work stoppages.

Modern Sugar Plant For Imperial Valley

WHAT is reported to be probably the most modern and streamlined beet sugar plant in the West is now under construction by Holly Sugar Corp., Colorado Springs, Colo., at Imperial, south of Brawley, in California's Imperial Valley. The plant will cost $3,000,000 and is reported to have a daily slicing capacity of about 2,500 tons, equivalent to 250-300 tons of sugar. Among the various new processing improvements to be incorporated in the plant is a battery of Silver continuous-diffusers to replace batch-operated tanks.

This new factory will bring to 13 the number of beet sugar plants operated by Holly in Colorado, California, Montana and Wyoming. Other plants in California are at Alvarado, Hamilton City, Santa Ana and Tracy. A. L. Cooper is chief engineer of Holly Sugar Corp., and V. I. Morris is construction superintendent.

F&DA Promotes Three Career Men

LEADERSHIP of Food and Drug Administration will continue under the senior career staff of that organization following three promotions made during December to posts of higher responsibility. These advances in position recognize men who have been, in each case, more than 20 years in the Federal service dealing with pure food and drug problems.

Charles W. Crawford has been advanced to the post of associate commissioner, a position which has remained vacant for 18 months since Dr. Paul Dunbar advanced from it to the position of commissioner.

Named as assistant commissioners are Louis D. Elliott and George P. Larrick. Dr. Elliott has headed the interstate division of F&DA and will continue to handle the problems of enforcement of food shipments in interstate commerce.

Dr. Larrick as the assistant commissioner will continue general supervision of the field force throughout the country and law enforcement on drugs and cosmetics.

Rushing home from school in time to get the icing bowl when Mother bakes cake has been a childhood rite for generations. Today's youngsters get a double portion of pot luck when the icing is made with Cocoa Marsh. Cocoa Marsh is more than tasty, wholesome chocolate syrup, it's nutritious . . . fortified with iron and Vitamin D. It's easy to use, too. Just mix it with hot or cold milk to make a delicious beverage, pour it over ice cream to make a sundae, or make it into a delicious icing for cake.

The Taylor-Reed Corporation, Mamaroneck, N. Y., manufacturers of Cocoa Marsh, have selected Crown Screw Caps,—handsomely lithographed in three colors,—as a secure, dependable seal for this product. Only Crown Screw Caps have the patented Deep Hook Thread which gives double the sealing pressure with the same amount of application force. Crown Cork & Seal Company, Baltimore 3, Maryland. *World's largest makers of metal closures.*

CROWN CLOSURES

We have a supply of

TOMATO PULP

IN DRY FORM

SARDIK

TOMATO FLAKES

Can be used by PACKERS in preparing a Tomato or Spaghetti Sauce.

Also used in cooking by Chefs in Hotels, Restaurants, Hospitals, Industrial Cafeterias and Institutions—just as purée is used.

Sample on Request.

SARDIK FOOD PRODUCTS CORPORATION

EXECUTIVE OFFICES

420 Lexington Avenue New York 17, N. Y.

Have you any processes where

Enzymes

might be employed to advantage in your research or manufacturing operations? Write or telephone us regarding any enzymes you may now need or any enzyme applications which you may be considering, and our Sales and Engineering Departments will place their entire facilities at your disposal without obligation.

TAKAMINE LABORATORY, Inc.

Clifton, New Jersey

Telephone Passaic 2-4776

Steel Strike Impairs Food Industry Output

THE steel industry strike will seriously impair production of badly needed farm implements and tractors, Alva W. Phelps, president of the Oliver Corp., said recently.

In addition, Mr. Phelps said, rehabilitation of farm equipment manufacturing plants for expanded and more efficient production will be slowed down if shipments of structural steel, machine tools and other equipment made from steel are halted.

"The food producers of the nation have gone much too long without new equipment and necessary repair parts due to the curtailment of production during the war years," Mr. Phelps said, "and the shutdown in steel production will aggravate the situation and have a decided effect upon the future food supplies of the nation."

Chef Boy-Ar-Dee May Join American Home

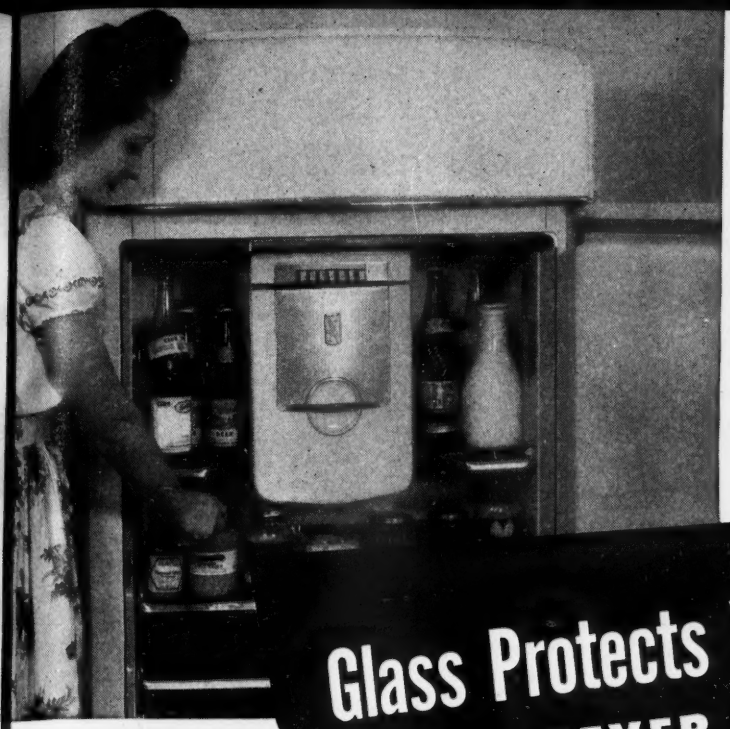
H. W. RODEN, President, American Home Foods, Inc., revealed that his company is negotiating to acquire Chef Boy-Ar-Dee Quality Foods, Inc., Milton, Pa., 16-year-old manufacturer of packaged spaghetti dinners, ravioli, and sauces.

If the transaction is consummated, the company will become the fourth division of American Home Foods, which last year became a subsidiary operating company of American Home Products Corp. The other divisions are: Clapp's Baby Food, Rochester, New York, and San Jose, Calif., acquired in 1939; G. Washington Coffee Refining Co., Morris Plains, N. J., 1943; and P. Duff & Sons, Inc., baking mixes, Pittsburgh, Pa., acquired in 1944.

Another division in the making, at American Home Foods, will utilize the new anhydrous process recently invented by Clarence Birdseye for the quick drying of fruits and vegetables.

Curtiss Dividend

THE board of directors of Curtiss Candy Company has declared a dividend of 30 cents per share on the common capital stock of the company, payable January 10, 1946, to stockholders of record December 31, 1945, and the regular quarterly dividend of $1.12½ per share on the preferred stock of the company, payable January 15, 1946, to stockholders of record December 31, 1945, according to an announcement by Otto Schnering, president.



Glass Protects Your Products
WHEREVER USED!

FROM the moment your product is placed in its container, it needs constant protection. Especially so in the home of the consumer where it is most likely to be exposed to careless handling and contamination.

Anchorglass Containers provide this protection—*all the way.* They bring your product to the consumer with all its original goodness intact and keep it that way until entirely consumed. Glass imparts no foreign flavor, taste or aroma to mar the quality of the product or detract from its full enjoyment. Clean, sparkling glass containers are easily opened and resealed, permit 100% product inspection, serve as a storage jar, and eliminate for the housewife the necessity for, and the mess, waste and chance of contamination of transferring the contents to another container.

That's why women prefer glass packed products. That's why it will pay you to package your products in Anchorglass Containers. There are many production advantages to packing in glass, too, that we would like to discuss with you.

tune to ANCHOR HOCKING'S HOBBY LOBBY
CBS NETWORK . . . THURS. EVE.

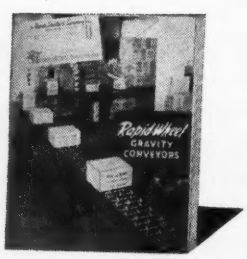
Anchor
CONTAINERS and CAPS

PRODUCTS OF
ANCHOR HOCKING GLASS CORPORATION
LANCASTER, OHIO

Do the Job Right with *Rapid-Wheel* CONVEYOR

Help yourself and your employees' "aching backs" by using Rapid-Wheel Gravity Conveyor. Now available in standard 5' and 10' sections.

It's wise to Conveyorize! Send for your FREE copy of the new Rapid-Wheel Conveyor catalog. Complete features, specifications, data, accessories and uses. Write Today!



OFFICES IN PRINCIPAL CITIES

Manufacturers of
STEEL FORGED CASTERS - TRUCKS - CONVEYORS - POWER BOOSTERS

The Rapids-Standard Co., Inc.

Sales Division—361 Peoples National Bank Bldg., Grand Rapids 2, Michigan

Look for 1946 Decline In Milk Production

MILK production in 1946 is expected to decline slightly from the all-time peak of approximately 123,000,000,000 lb., reached in 1945, says a report of the bureau of agricultural economics. The extent of the decline will depend upon weather and the total returns to dairy farmers, including dairy production payments.

The number of milk cows probably will be reduced and milk production per cow may also decline from the record 1945 level, when unit returns were accompanied by exceptionally good pasture conditions. Milk production per cow in 1945 is indicated at nearly 4,000 lb., 5 percent above 1944 and 1 percent above the previous record, that of 1942.

Rates Lowered

RATE reductions averaging over 40 percent became effective, January 20, on seafood flown from Boston to 45 cities in the country, according to the air express division of the Railway Express Agency. The cities benefitting from the reductions are largely in the south, although St. Louis, Indianapolis, New York and Chicago are included.

PROCESSING

Build Rice Plant to Utilize New Process

A NEW rice process will be utilized in a $350,000 plant now being built by the Walton Rice Mill, Inc., Stuttgart, Ark. Invented by Sgt. Milton Yonan-Malek, a Persian - American attached to the cooks and bakers school, Ft. Meade, Md., the method produces a more nutritious rice, provides sterilization and has better storage qualities. The method has been highly approved by the Office of the Quartermaster General.

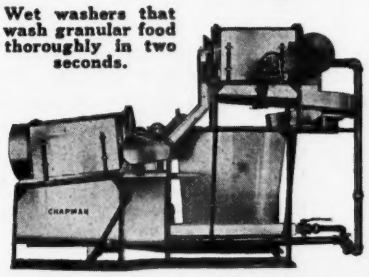
In operation, the rough rice is soaked and steam treated, then mechanically dried and cooled to room temperature. This involves steeping paddy rice in waters at controlled temperatures, treatment at controlled steam pressure in specially-designed cooking vessels, drying in large rotary-type steam tube dryers and then cooling and aeration by rotary coolers.

The outer hull and bran layers of the rice, containing a large percentage of natural vitamins, act as a separate cover or protector for each grain during the processing. When the paddy rice is subjected to the

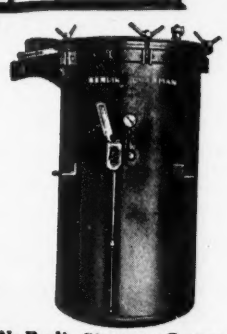
A COMPLETE LINE OF PRODUCTION FOOD PROCESSING MACHINERY

Let us tell you now how Berlin Chapman high speed equipment can help you attain both increased production and at the same time turn out the highest quality products. Berlin Chapman equipment is a line built for performance — and backed by over 35 years' successful experience in serving the food processing industries. Illustrated here are only four of the items from the complete line.

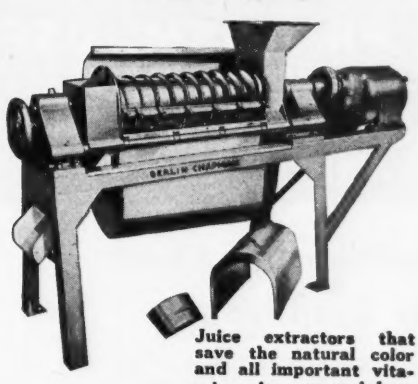
Wet washers that wash granular food thoroughly in two seconds.



Exhaust boxes that exhaust every can in the same period of time, and with unlimited capacity.



No Berlin Chapman Retort has ever been replaced by any other make.



Juice extractors that save the natural color and all important vitamins in your juices.

Write for complete information on any equipment you may need.

BERLIN CHAPMAN CO. • BERLIN, WISCONSIN

HIGH SPEED JUICE EQUIPMENT

- Juice extractors
- Juice tanks
- Coils
- Exhaust boxes

PEA PROCESSING EQUIPMENT

- Washers
- Blanchers
- Picking tables
- Separators
- Graders
- Regraders
- Elevators
- And all equipment necessary for pea processing.

TOMATO PROCESSING MACHINERY

- Soak tanks
- Rotary washers
- Scalders
- Roller inspection tables
- Peeling tables
- Screw type extractors
- Heating tanks and coils
- Tubular heaters
- And special machinery necessary for tomato processing.

CORN PROCESSING EQUIPMENT

- Corn silkers (high speed)
- Corn mixers
- Double batch corn mixers
- And other equipment necessary for corn processing.

COOK ROOM EQUIPMENT

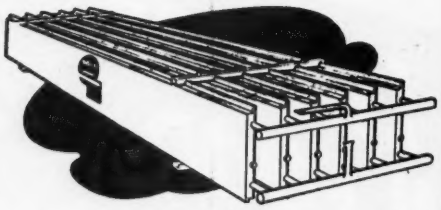
- Retorts
- Continuous cookers and coolers
- Perforated crates
- Hoists

Berlin Chapman

CANNING MACHINERY FOR ALL FOOD PRODUCTS

DOLE

Vacuum Plate



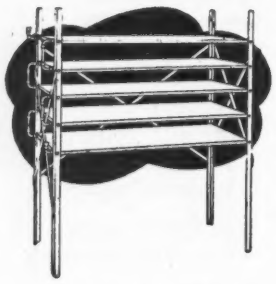
Dole Locker and Storage Plates Available in different sizes.

REFRIGERATING UNITS

for

- QUICK FREEZING
- PRESERVING
- TRANSPORTING

FOOD



Quick Freeze Plate Unit Available in different sizes.

Dole plates are used and recommended by outstanding Refrigeration equipment manufacturers. Used by the Government for Cold Storage Rooms in the U. S. A. and Foreign Bases.

DOLE Vacuum COLD PLATES for REFRIGERATION PURPOSES

Write for Catalogs, Engineering assistance or a representative to call — no obligation

DOLE REFRIGERATING COMPANY
5910 N. Pulaski Rd., Chicago 30, Illinois
N. Y. Branch: 55 W. 42nd St., New York 18, N. Y.

WHERE DECAY, ODOR, TASTE, OR ACID IS A PROBLEM, USE *Tidewater* RED CYPRESS

Read What Authorities Say About Its Superior Qualities

Romeyn Beck Hough, author of "American Woods", says of Cypress "Its great durability, immunity from the attacks of parasites, and non-liability to great shrinking or warping make it one of our most valuable woods for all woodwork exposed to weather, for tank construction, cooperage, etc. Its value . . . is enhanced by its comparative freedom from coloring or flavoring ingredients".

Phillips A. Hayward, author of the volume on Wood in Chandler Cyclopedia, says that Cypress is "easy to work, available in large dimensions, and resistant to decay". It is also "resistant to changes in moisture, resistant to acids, and imparts neither color nor taste."

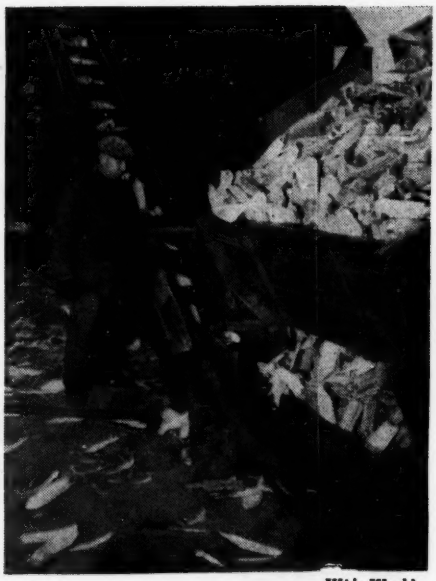
For a hundred industrial needs, TIDEWATER Red Cypress is the right answer. Write today for full details.

S C M A **Tidewater** RED CYPRESS

Tide Water Red Cypress "The Wood Eternal"

FLEISHEL LUMBER CO.

4230 Duncan Ave. • St. Louis 10, Missouri • NEwstead 2100



Wide World

CORN RAISER

One man and a power combine can harvest 1,000 bu. of corn a day. After harvesting, on this Kansas farm, the corn is dumped into the elevator bin and carried from there into storage by the elevator.

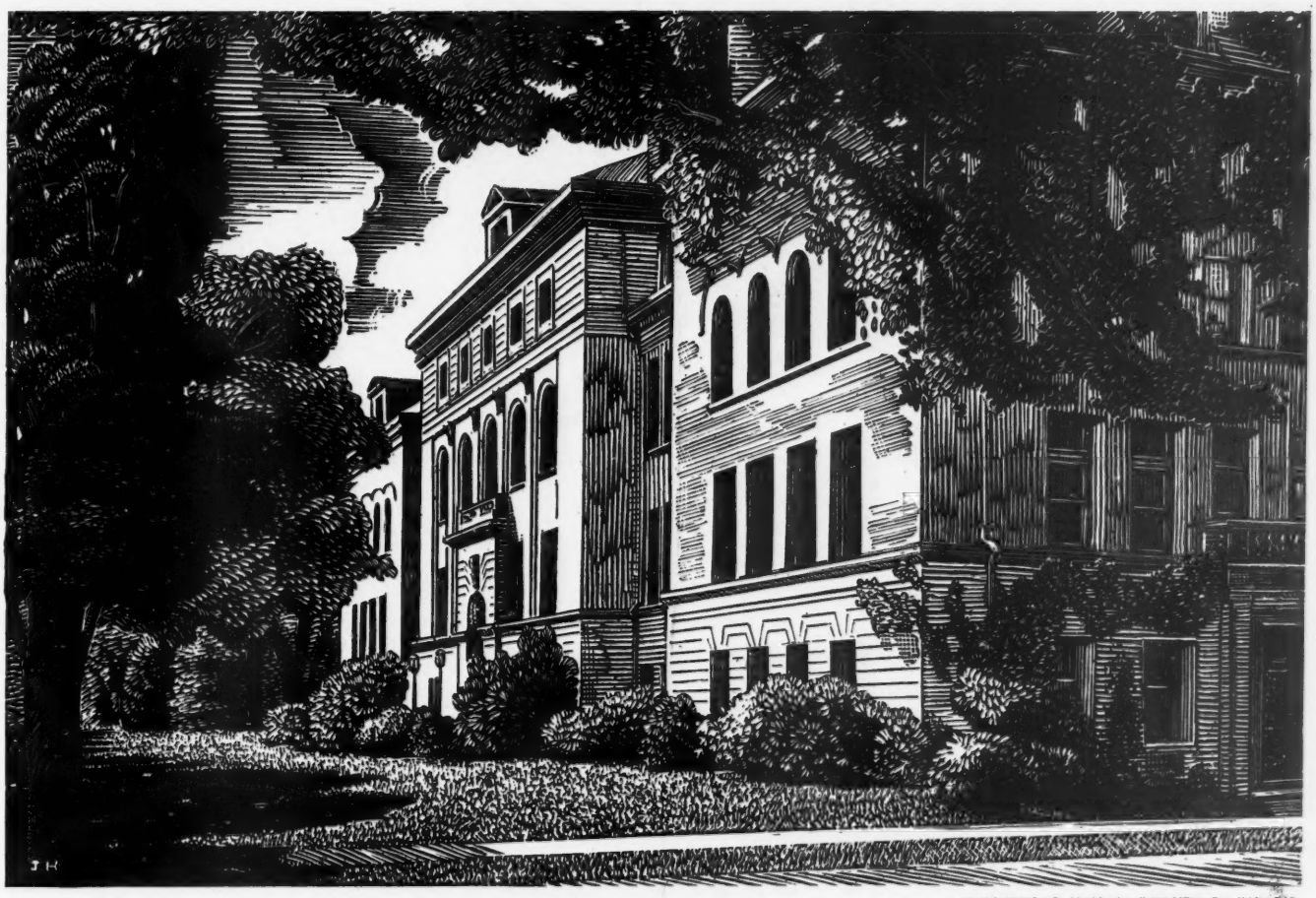
steam-steeping treatment, the grain is gelatinized, absorbing the essential vitamins from the outer cuticle. Thus, when the hull and bran layers are later removed by the present milling operation, the inherent vitamins natural to the grain instead of being scoured off are driven into and retained inside the cell structure of the grains. After treatment the grains become hardened, insuring their keeping qualities, also reducing the hazard of insect infestation.

Chemistry Ups Market For Orange Peel Oil

A CHEMICAL triple play has opened two markets for orange peel oil, a bitter substance which is first carefully eliminated from orange juice, the American Chemical Society journal, *"Industrial and Engineering Chemistry,"* reports. "Citrus peel oil is in fair demand as a flavoring agent, principally for beverages, but less oil is produced than could be. Its recovery is more or less optional in canning operations for oranges and grapefruit.

"A 10 to 1 concentration removes most of the limonene, the terpene which constitutes about 90% of orange oil and is largely responsible for its instability. The concentrate keeps better than the original oil, and the limonene finds application as a perfume or odor killer in cheap soaps," the report said.

In the industrial preparation of citrus juices, a main problem is to extract the maximum juice without



ENGINEERING HALL, UNIVERSITY OF ILLINOIS

A Leading University

USES BUELL FLY ASH PROTECTION

POWER PLANTS throughout the industries and institutions that serve America recognize the efficiency of Buell (van Tongeren) Collectors as a protection against fly ash dispersion.

Among the various power plants using Buell Fly Ash Collectors is a leading American educational institution, the University of Illinois at Champaign. The plant of the University has used six Buell Collectors with its stoker-fired boiler, for the elimination of fly ash, over a period of several years.

In fact it may be said that power plants employing Buell Collectors represent a fair cross-section of American industry. They include such well known concerns as: BETHLEHEM STEEL COMPANY, STEELTON, PA., PHILADELPHIA NAVY YARD, WESTVACO CHLORINE PRODUCTS CORPORATION, CONNECTICUT LIGHT AND POWER COMPANY, JACOB RUPPERT BREWERY.

Detailed information on Buell Collectors to meet your specific fly ash requirements will be gladly furnished upon request.

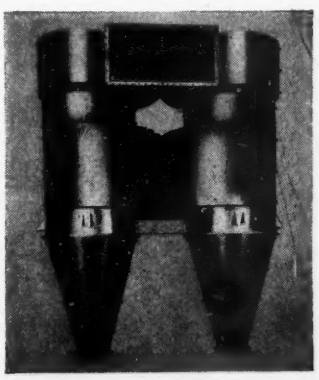


Illustration shows typical unit of a battery of six Buell Fly Ash Collectors installed with stoker fired boiler in power plant of University of Illinois.

BUELL ENGINEERING COMPANY, INC.
Suite 5000, 8 Cedar Street, New York 5, N. Y.
Sales Representatives in Principal Cities

CONSULT BUELL *First* IN DUST RECOVERY
FOR CHEMICAL • ROCK PRODUCT • METALLIC • FOOD • FLUE OR ANY OTHER DUSTS

buell
DUST RECOVERY SYSTEMS

Why you Should Choose
CYCLONE CONVEYOR BELTS
Cyclone Flat Wire belt helps this processing and cooling conveyor to operate efficiently for long periods without breakdowns. Standard opening sizes are 1" x 1" and ½" x 1".
YOU get (1) prompt service and cooperation, (2) practical engineering aid . . . when you put your belt problems up to Cyclone. Our salesmen, engineers and metallurgists are thoroughly qualified to help you decide whether Flat Wire, Chain Link or the Flex-Grid type of belt will work best . . . which metal, alloy or finish will best meet *your exact operating conditions.* You are protected by Cyclone's enviable reputation for quality . . . by our 25 years of experience in making metal conveyor belts. Furthermore, all the facilities of United States Steel are at your disposal. There's a Cyclone salesman near you . . . offices in principal cities . . . factories in the Middle West and on the Pacific Coast. We will gladly send you our Catalog No. 3, on request. There is no obligation involved. Write us today.
CYCLONE FENCE DIVISION · American Steel & Wire Co.
USS
CYCLONE
"Red Tag"
METAL BELTS
UNITED STATES STEEL
By the makers of Cyclone Fence
CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Dept. B-26, Waukegan, Illinois
United States Steel Export Company, New York
UNITED STATES STEEL

PROTECTION + SALES APPEAL
for
FOOD PRODUCT PACKAGING
Shippers of packaged foods find in Hummel & Downing Company's integrated production and customer services the answer to most of their problems in selection of the best folding or display cartons and shipping cases. We take entire responsibility for the package from production of the boxboard to printing the finished carton.
HUMMEL & DOWNING COMPANY
MILWAUKEE 1, WISCONSIN

including any of the bitter oil from the skin, the journal explains. "Peel oil deteriorates and may help to reduce the keeping quality of the juice. A little oil is thought to improve flavor. Too much oil, however, tastes unpleasant to most people and actually upsets digestion.

"Tests conducted at the University of Florida have shown that 85 percent of the people who were asked to choose between the flavor of juice from peeled oranges and juice to which 0.05 percent peel oil had been added said they preferred the oil-free juice. Ten percent liked better the juice containing oil, and 5 percent could not tell the difference. But regardless of likes or dislikes, the added oil made everybody burp.

"Efforts to avoid getting too much peel oil in the juice are largely centered on giving the fruit a 1-2 minute treatment in hot water. This softens the peel and allows the juice to be pressed out without breaking too many of the oil cells."

Mechanical juicers, the publication explains, are adjusted to certain sizes of fruit, and variations in the size or thickness of the skin will either leave some of the juice, or squeeze oil out of the skin. De-oilers have been used which give the juice a quick-boil under vacuum to remove the more volatile oil, but there are difficulties and the equipment is expensive.

Aging at 60 Degrees Speeds Cheese Making

AMERICAN CHEDDAR cheese can be made of excellent quality and flavor in three to four months by a new method developed in Bureau of Dairy Industry, according to Department of Agriculture recommendations of December. Bureau investigators state that the new process is commercially feasible, simple, and economical.

The process requires aging at 60 deg. F. to produce a fully ripened product in half the time normal for customary aging at 50 deg. To permit the higher temperature and speed, requires cheese making from quality milk that has been pasteurized, and the use of good starters. Closely controlled methods, but within the skill of ordinary operators, are necessary to maintain acidity within proper limits during the whole manufacturing process. Inferior milk and sloppy methods of cheese making do not permit the higher temperature and fast aging as bad flavors and an inferior product is almost certain unless proper precautions are taken at all stages.

MORE AND BETTER *Service* FROM TODAY'S VALVES

"RESOLVED:
"That the superintendent
"shall be held responsible
"for the production of goods
"as near perfect in design,
"material and workmanship
"as shall make them merchantable
"and of a character that will serve
"to establish for this company
"a high reputation."

The policy expressed by this early Pratt & Cady Board of Directors Resolution has not been shaken even by the great World War. More than ever before the valves offered by Reading-Pratt & Cady today meet the demand for longer and better service.

R-P&C offers you a single responsible source for bronze, iron and steel gate, globe, angle and check valves—cocks and Lubrotite gate valves—bar stock valves—cast steel fittings—d'Este Automatic Regulating valves.

READING-PRATT & CADY

MANUFACTURERS OF
READING CAST STEEL VALVES AND FITTINGS • PRATT & CADY BRASS AND IRON VALVES
D'ESTE AUTOMATIC REGULATING VALVES

Reading, Pa. • Atlanta • Chicago • Denver • Houston • Los Angeles • New York • Philadelphia • Pittsburgh • San Francisco • Bridgeport, Conn.

ACCO

READING-PRATT & CADY DIVISION
AMERICAN CHAIN & CABLE

ACCO TRADE MARK

Available in 5-lb. cans 100-lb. drums
Easy to use
A great Bactericide in the FOOD INDUSTRY
CONTENTS 5 LB. NET
PERCHLORON
REG. U.S. PAT. OFF.
A Stable Calcium Hypochlorite Powder for use as a Sterilizer and Deodorant
PENNSYLVANIA SALT MANUFACTURING COMPANY
Chemicals
1000 WIDENER BUILDING, PHILADELPHIA

PERCHLORON is a desirable source of chlorine, quick acting and not injurious to metals, at recommended concentrations. Perchloron will not impart odors or flavors to food products which contact sterilized utensils.

AS A BACTERICIDE, PERCHLORON IS USED IN:

Milk separators and ice cream freezers

Cream and cheese factory utensils

Preserving, baking and candy-making utensils

Bottle washing equipment

Cannery equipment

Tanks and tank cars

Tables, shelves and floors

Other Penn Salt Products for the Food Industry

B-K Bactericide
G M Kleanser
Anhydrous Ammonia
DDT Insecticides

PENNSYLVANIA SALT MANUFACTURING COMPANY
Chemicals
1000 WIDENER BUILDING, PHILADELPHIA 7, PA

New York • Chicago • St. Louis • Pittsburgh • Cincinnati • Minneapolis • Wyandotte • Tacoma

Wafer Developed That Utilizes Skim Milk

A CRISP, light-brown salted wafer with a slight cheese-and-toasted-potato flavor has been developed from potato and skim milk by dairy scientists of the U. S. Department of Agriculture in the course of research on new ways to use surplus milk. Sticks or croutons also may be made of this potato - and - skim - milk mixture by bakers, biscuit makers or other food specialty manufacturers. The product offers a new outlet not only for skim milk, so valuable nutritionally, yet so frequently in surplus supply, but for potatoes, especially smaller and cheaper grades, also often in surplus.

Because the wafers contain no fat and do not absorb moisture readily, they keep better than such products as potato chips or shoe string potatoes, yet have much the same flavor appeal.

The process of making, on which there is a public service patent, is simple and requires no complicated manufacturing equipment. A mixture of boiled riced potatoes and dry or concentrated skim milk is seasoned with salt and whipped until it resembles mashed potatoes, then pressed through a tube and nozzle into the shape of wafers or other desired forms, and dried on wire screen in a hot-air tunnel. The dried wafers are then toasted to a light-brown color. The drying and toasting develops the cheese flavor from the casein of the skim milk.

The wafers keep well in any moisture-proof container such as a tight cellophane bag, lined paper bag or can.

Wafers of different flavors are a possibility. One found especially good was coated with a commercial cheese flavor that does not become rancid.

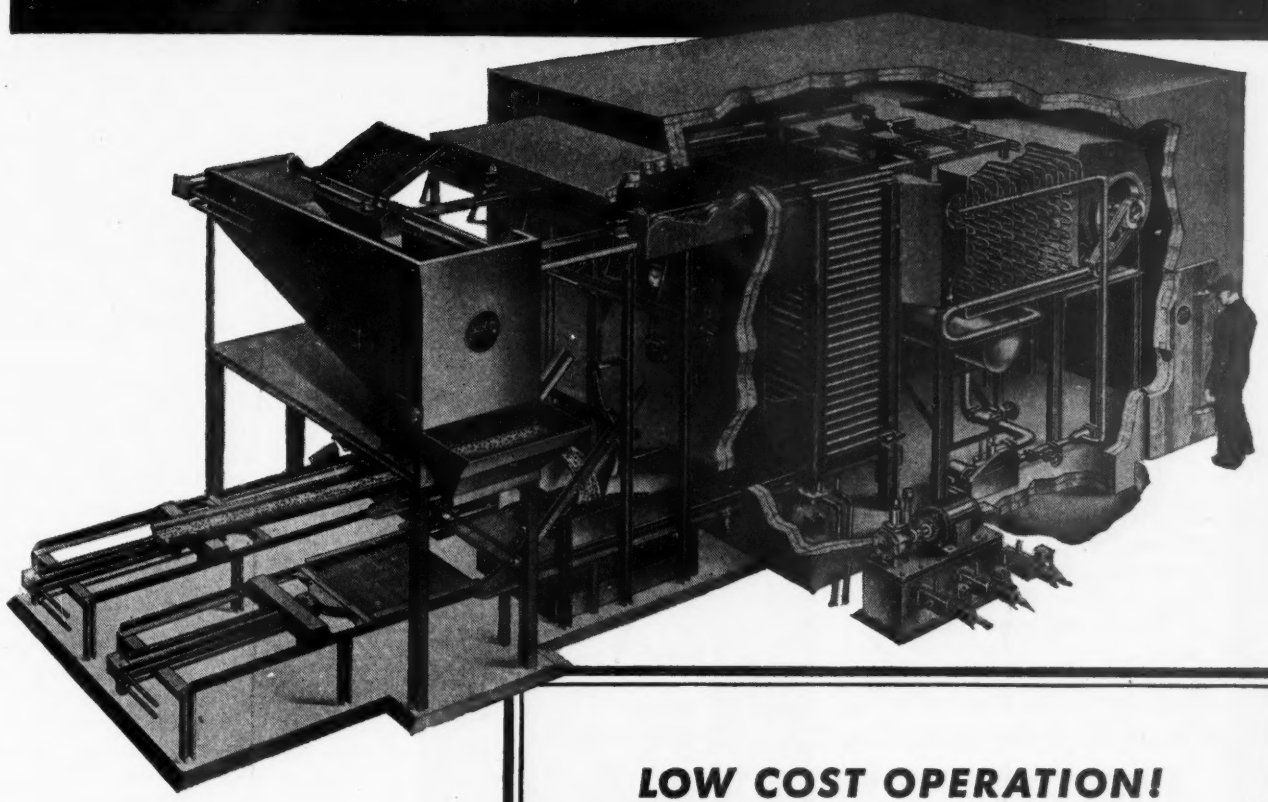
Completely Safeguard Use of Amino Acids

IN response to a request for information, Food and Drug Administration has stated its policy definitely to the trade regarding the conditions under which amino acids may be used in either standardized or nonstandardized foods. Most important to its lengthy ruling, which will be supplied as TC-2A under date of November 5 on request, is the following:

"Amino acids cannot be added to any food for which a definition and standard has been promulgated because no provisions have been made for their use in any of the standards that are now effective. There are no prohibitions against

COMPLETELY AUTOMATIC!

...The York CONTINUOUS Fast Freezer



More product can now be frozen with less manpower. From inspection belt to the final packaging of the frozen product all food handling is eliminated.

Operating cycle consists of feeding trays of product in at bottom of freezing column, stepping each tray up through column at a predetermined rate, discharging trays of frozen product at the top, automatieally dumping product from trays, and finally returning empty trays to starting position.

York Corporation, York, Pennsylvania.

LOW COST OPERATION!

★ Minimum dehydration. Loose product enters freezing column directly from flume line. The ice film formed on product, provides protection during freezing and storage.

★ Sanitary operation. No product handling.

★ Rugged design of entire equipment minimizes maintenance costs.

★ Rapid, "lunch hour" defrosting. Freezing column need not be emptied.

★ Provisioa can be made for bulk freezer utilizing the same refrigeration and air circuit.

YORK REFRIGERATION AND AIR CONDITIONING

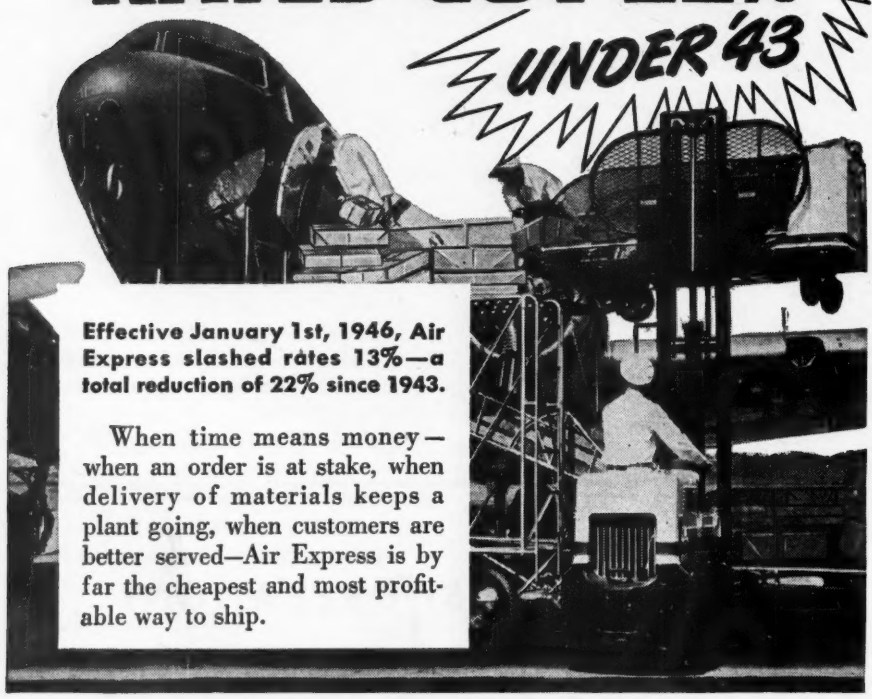
HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

SAVE TIME MAKE MONEY

SHIP by AIR EXPRESS

RATES CUT 22%

UNDER '43



Effective January 1st, 1946, Air Express slashed rates 13%—a total reduction of 22% since 1943.

When time means money—when an order is at stake, when delivery of materials keeps a plant going, when customers are better served—Air Express is by far the cheapest and most profitable way to ship.

Specify Air Express—a Good Business Buy

Shipments travel at a speed of three miles a minute between principal U. S. towns and cities, with cost including special pick-up and delivery. Same-day delivery between many airport towns and cities. Rapid air-rail service to and from 23,000 off-airline points in the United States. Service direct by air to and from scores of foreign countries in planes made in America, operated by American personnel and flying the U. S. flag.

HERE'S HOW LITTLE IT COSTS (U. S. A.)

AIR MILES	2 lbs.	5 lbs.	25 lbs.	40 lbs.	Over 40 lbs. Cents per lb.
149	$1.00	$1.00	$1.00	$1.23	3.07
349	1.02	1.18	2.30	3.68	9.21
549	1.07	1.42	3.84	6.14	15.35
1049	1.17	1.98	7.68	12.28	30.70
2349	1.45	3.53	17.65	28.24	70.61
Over 2350	1.47	3.68	18.42	29.47	73.68

AIR EXPRESS

AIR EXPRESS

GETS THERE FIRST

Write Today for new Time and Rate Schedule on Air Express. It contains illuminating facts to help you solve many a shipping problem. Air Express Division, Railway Express Agency, 230 Park Ave., N. Y. 17. Or ask for it at any Airline or Railway Express office.

Phone AIR EXPRESS DIVISION, RAILWAY EXPRESS AGENCY
Representing the **AIRLINES** of the United States

the addition of amino acids to foods for which there are no definitions and standards other than those that relate to misbranding. A food to which amino acids have been added will be regarded as a food for special dietary use and must, therefore, be labeled to conform to the regulations under Section 403 (j)."

Fast Freezing Adds Tenderness to Meat

MEAT may be frozen at temperatures as low as —40 to —114 deg. F. in the future, if maximum tenderness should prove worth the extra cost of such very low-temperature freezing. Recent research at the Department of Agriculture shows that the faster meat freezes, the more tenderness it acquires in the process. Beef frozen at 18 deg. F. and then thawed proved to be about 9 percent more tender than unfrozen beef, but beef frozen at —114 deg. F. was about 28 percent more tender. Usual freezing temperatures for meat today are 0 to —10 deg. F.

The microscopic studies of frozen meat showed that the tenderizing effect of freezing depends partly on how and where ice crystals form in the meat. In slow freezing at 18 deg. F., large crystals form between the muscle fibers, pushing the fibers out of shape but not breaking them, and drawing water from the fibers as they form.

In fast-freezing at —10 deg. F. or below, smaller crystals form within the fibers, because there is not time for water to be drawn out. In forming, the crystals break the fibers, thus making the meat more tender.

The lower the temperature and the faster the freezing, the more small crystals form within the fibers and the more the fibers break. At —114 deg. F. the freezing is so rapid that nearly every fiber in the meat splits.

To Teach Food Colors At Brooklyn Polytech

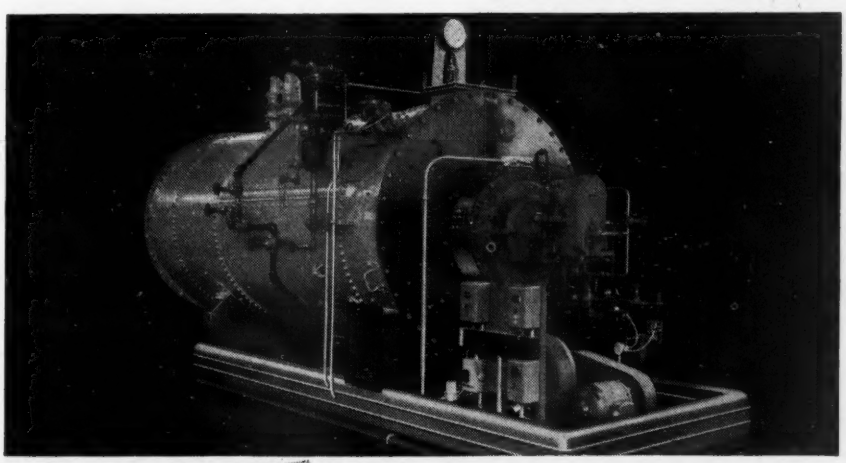
SINCE many food colors are made in the New York area, the Polytechnic Institute of Brooklyn rounds out its program in food technology with a new course on the Technology of Food Flavors, Colors, and Synthetic Additives, given in the Department of Chemical Engineering.

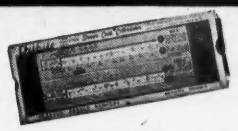
Dr. Morris B. Jacobs, senior chemist of the chemical laboratories of the Department of Health of the City of New York, who is an authority in the field of food colors, will present the course, which covers the historical and scientific background of the addition of these materials to foods.

Teeter-totter
STEAM LOADS

FLUCTUATING or intermittent steam loads are no problem when you have custom-planned Cleaver-Brooks steam generators in your boiler room. Whether the demand is heavy or light, steady or variable, these sturdy, compact steam generators respond instantly and operate with a flat efficiency of 80% at low or high steaming rates. Consider all these additional advantages of a Cleaver-Brooks installation:

- A steam plant tailored for your job. Cleaver-Brooks analyzes your load conditions, space and equipment arrangements, future growth needs, puts unit into initial operation, instructs as to operation, care and maintenance.
- Designed for utmost convenience of operator — all controls may be operated from front of boiler. A factory engineer puts unit into initial operation, and trains your employees in operation, care and maintenance.
- One source and one responsibility for the complete generator — Cleaver-Brooks Factory-finished and tested — a fully "packaged" unit meeting all code requirements.
- Fast installation. No special foundation needed. Within 24 hours after arrival, your Cleaver-Brooks Steam Generator can be in operation.
- No smoke-stack required; simple roof-high vent exhausts combustion gases.
- Saves space, uses less plant area, fits into low head-room locations.
- Oil-firing eliminates smoke, ashes, clinkers, messy-boiler-room conditions.
- Low operating costs; unsurpassed guarantee: — 80% thermal efficiency; 13% CO_2 gases; stack temperature not to exceed 125° F. above saturated steam temperature.
- Quick steaming — for any emergency or fluctuating loads — through high heat transfer with Cleaver-Brooks 4-pass down-draft construction and integral oil-burner.
- Full size range is available — 22 models in sizes from 15 to 500 h.p., at steam pressures from 15 to 200 lbs. p.s.i. Write for bulletin and complete information.



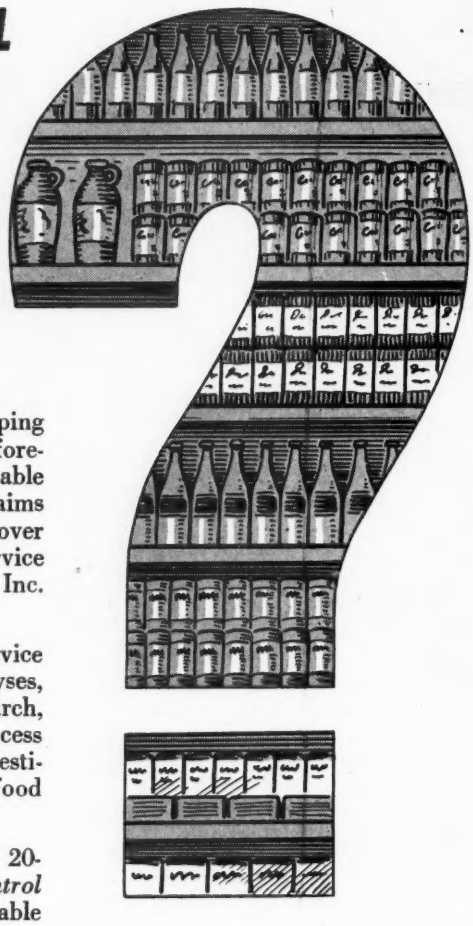


WRITE ON YOUR BUSINESS LETTERHEAD for the Free Steam Cost-Calculator—a ready-reference sliderule showing the comparative steam costs when using oil or coal as fuel.

CLEAVER-BROOKS COMPANY
327 E. Keefe Ave., Milwaukee 12, Wis.

Cleaver-Brooks
STEAM GENERATORS

HOW LONG WILL YOUR PRODUCT REMAIN *saleable* ON THE SHELF?



To determine and establish keeping qualities of processed foods, to forestall dealers' spoilage losses, to enable food manufacturers to safeguard claims made for their products—these cover just one phase of the complete service provided by Schwarz Laboratories, Inc. to manufacturers of food products.

Other phases of this unique service are chemical and biological analyses, vitamin assays, studies of food research, food plant design, inspection, process examination and control, and legal testimony for substantiation of justified food and beverage claims.

This service is outlined in a new 20-page bulletin *"Scientific Quality Control of Foods and Beverages"*, now available for food and beverage plant executives, chemists, engineers. This useful publication should be in every food and beverage plant. Write for your copy today.

Schwarz laboratory experts checking various processed cheese samples for flavor, aroma, microscopic condition.

Schwarz

202 EAST 44th ST.
NEW YORK 17, N. Y.

LABORATORIES, INC.

Floating Fish Cannery Leased to Seattle Co.

THE Pacific Exploration Co., Seattle, has leased the S.S. Mormacrey, an 8,800-ton ship that the RFC is converting into a floating cannery, for the canning and freezing of fish. The conversion job is not expected to exceed $3,750,000 and should be completed by the latter part of February. The ship will be accompanied by four trawlers, which will be used to fish for the giant King crab and bottom fish for freezing. The company also intends to catch salmon, part of which haul will be frozen and the rest canned. It is also possible that the fleet will be used for tuna fishing.

Vitamin D Patents Now Public Property

PATENTS controlling production of Vitamin D are now public property under a consent decree entered in U. S. District Court, in Chicago, last month. The decree ended the Department of Justice anti-trust action against the Wisconsin Alumni Research Foundation, which controlled the patents, and 17 firms holding licenses to produce under them.

The firms named in the anti-trust action, all of which have now canceled their restrictive agreement with the foundation, include: Quaker Oats Co., Standard Brands, Inc., Gelatin Products Corp., Borden Co., Carnation Co., Pet Milk Co., Indiana Condensed Milk Co., Nestle's Milk Products, Inc., and Abbott Laboratories.

RAW MATERIALS

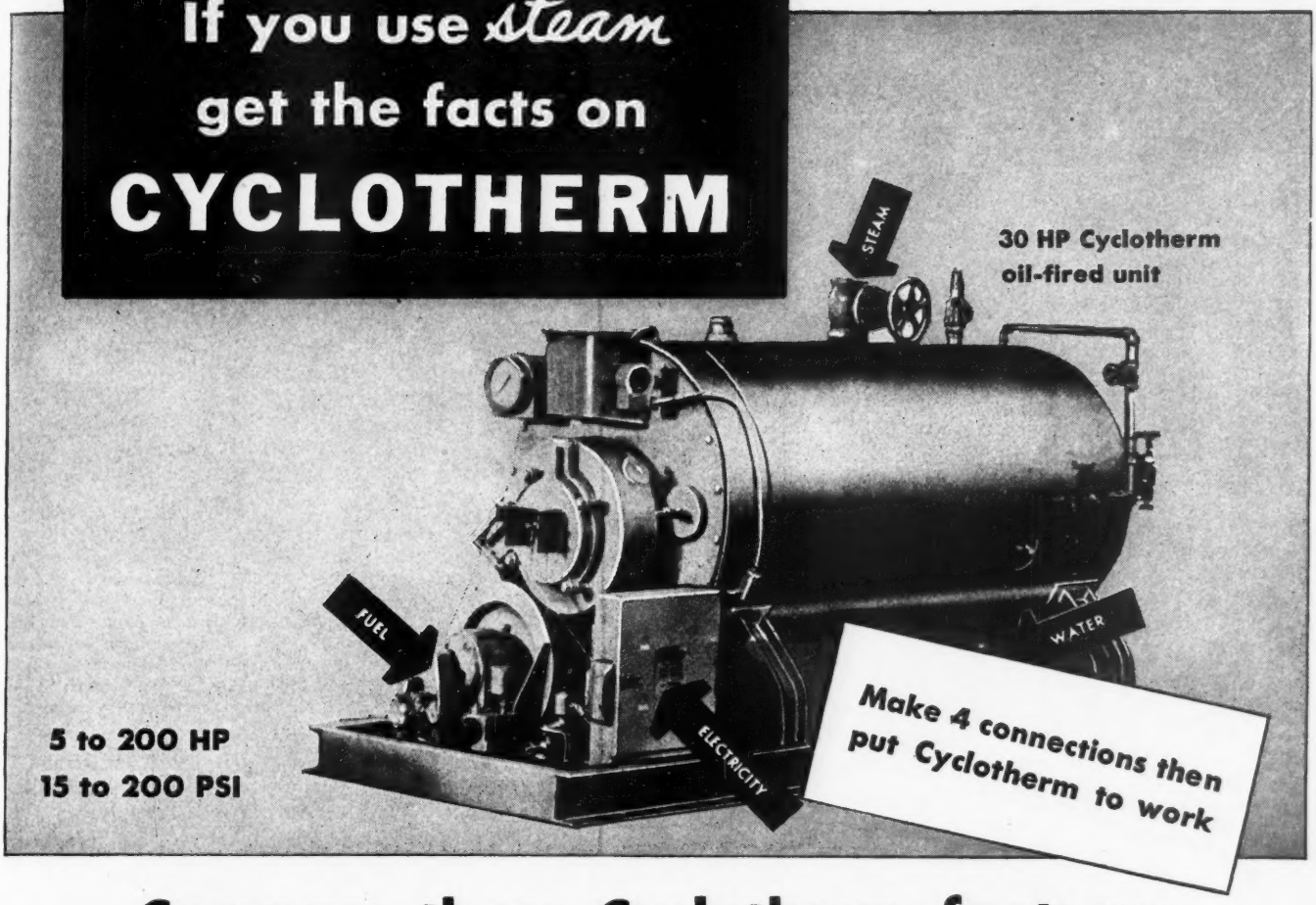
Millers Are Concerned Over Wheat Shortage

SHORTAGE in wheat, available for milling, is causing severe headaches throughout the grain areas of the United States. This condition exists in spite of the 281,000,000 bu. carry over from the 1944 crop, the 1945 crop of 1,123,000,000 bu., and imports of 10,000,000 bu. reported by the Department of Agriculture.

As many as four flour mills in Texas, two in Virginia and one in North Carolina were shut down as of Jan. 15, with several others in Texas, Oklahoma, North Dakota and Tennessee on the verge of stopping operations. These are large commercial mills, not small local-market mills.

Results of a detailed survey in various geographical areas by the Millers National Federation reveal an actual condition in wheat supply that contradicts the statistics of the

If you use *steam* get the facts on CYCLOTHERM



Compare these Cyclotherm features with those of any other make

• *Cyclotherm Burner* — Specially designed, "built-in", integral component of steam generator unit — Provides complete combustion with rapid, evenly distributed heat transfer — Fires any liquid or gaseous fuel.

• *Fully Automatic Heavy Oil Operation* — Cyclotherm units 80 to 200 HP.

• *Wide Range Modulation* — Firing rate modulates automatically from 30% to 100% of full load in response to steam demand, sizes 80 to 200 HP.—Oil or gas operation.

• *Gas Firing* — Cyclotherm units may be fired with Manufactured, Mixed, or Natural Gas. Completely automatic operation for all sizes.

• *Cyclotherm Combination Burner* — Fires oil or gas; change-over from one fuel to another by merely throwing a switch.

• *Maximum Operating Efficiency* — Operating efficiency of Cyclotherm Generator unit will be not less than 80%.

• *Single Responsibility* — One manufacturer to deal with. Cyclotherm units shipped complete with boiler, burner, all controls and accessories assembled, fully piped and wired, test fired for performance, ready to operate on arrival.

• *Performance Record* — Thousands of Cyclotherm units performed all over the world with our armed services. Their record of efficient duty is your guarantee of the engineering "know-how" and experience built into each unit.

• *Fits in Small Area* — More compact and space saving — Favorable "go thru" dimensions.

Write, wire or phone for more complete information.

CYCLOTHERM STEAM GENERATORS

CYCLOTHERM CORPORATION, 90 BROAD STREET, BOX 401, NEW YORK 4, N. Y.

It's no secret

You hear it in food industries everywhere—the sure way to get real cleanliness throughout is by using Wyandotte. For the Wyandotte line is complete with *specialized* products for any kind of cleaning job in your plant . . . from washing utensils to aprons . . . from cleaning floors to germicidal rinsing or spraying.

For full information about the advantages of the Wyandotte line, just call or write your Wyandotte Representative. He'll be glad to show you how Wyandotte can solve *any* cleaning problem for you —quickly, efficiently and safely.

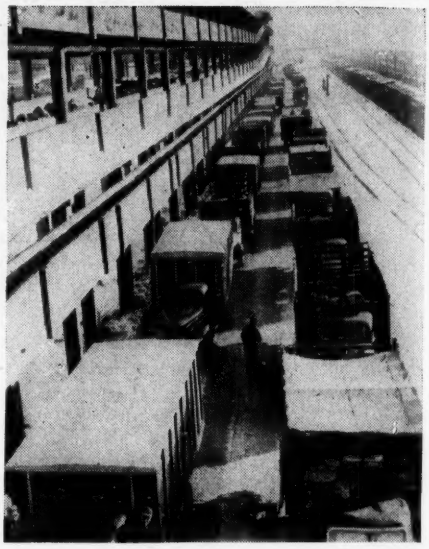
Wyandotte

REG. U. S. PAT. OFF.

WYANDOTTE CHEMICALS CORPORATION • J. B. FORD DIVISION

Wyandotte, Michigan

Service Representatives in 88 Cities



Wide World

BEATING THE STRIKE

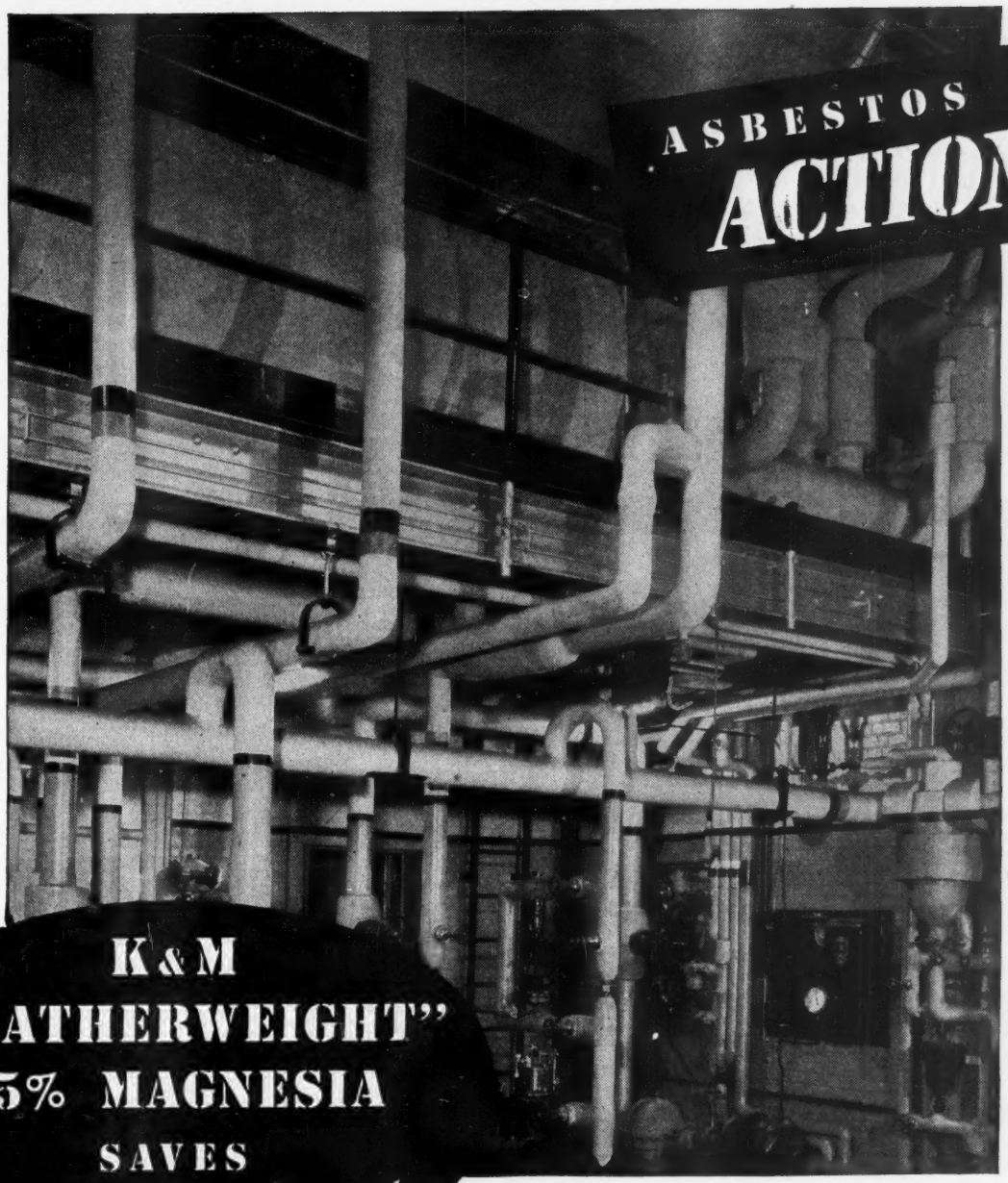
When the packinghouse strike was only a threat, early in January, farmers in the St. Paul, Minn., area rushed their hogs to market. The lowered income taxes also had something to do with the lines of trucks, some of which extended four miles back from the unloading pens. On January 3, an estimated 35,000 porkers were delivered.

Department of Agriculture. Reports from 69 percent of the Texas-Oklahoma milling capacity show wheat-on-hand equivalent to a 33-days grind and wheat-on-contract equivalent to a 6-days grind. Mills representing 87 percent of the milling capacity of the interior Kansas and Missouri river areas have wheat-on-hand equivalent to a 33-days grind and wheat-on-contract equivalent to 18 days of milling. Similar conditions prevail in other wheat milling areas.

One explanation for the disappearance of available wheat stocks is the record-breaking wheat-flour production during the present crop year. During the first four months, total wheat flour production was 9,246,-919,300 lb. compared with 7,979,871,-400 lb. during the same months in 1944. October, 1945, flour production alone was 2,480,543,700 lb., 350,000,-000 lb. more than that for October, 1944, the largest production of flour ever milled in one month. Much of this increased flour production was for export shipments.

The domestic use of wheat for food purposes, however, is still in line with the Department of Agriculture estimate of 540,000,000 bu. for the crop year ending July 1, 1946. The disturbing factors in this wheat shortage are the amounts used for livestock feed, the wheat still on the farms and in country elevators, and wheat being exported as wheat.

An earlier Department of Agriculture estimate on disappearance of wheat for livestock feeding was 170,-



K&M "FEATHERWEIGHT" 85% MAGNESIA SAVES HEAT · FUEL · MONEY

TESTED BY TIME . . . PROVED BY PERFORMANCE

The extensive network of steam and hot water lines in this large mid-western power plant are insulated with K&M "Featherweight" 85% Magnesia. This choice was not the result of guesswork, but was based on sound engineering calculations made after a thorough analysis of previous pipe line heat losses.

K&M "Featherweight" 85% Magnesia Pipe Insulation offers lasting effectiveness, durability, dependability and low maintenance costs. It saves heat . . . fuel . . . money. For temperatures up to 600° F., no other material can offer such enduring economy.

K&M "Featherweight" 85% Magnesia Pipe Insulation combines the high insulating qualities of basic Carbonate of Magnesia with strong Asbestos Fibres. Although extremely light in weight, it delivers maximum efficiency. For 65 years, plant operating men have known "Featherweight" as a symbol of quality.

K&M best in asbestos

KEASBEY & MATTISON

COMPANY • AMBLER • PENNSYLVANIA

REPAIRS SPEEDED
DOWNTIME REDUCED
COSTS CUT . . .

by LUNKENHEIMER
Interchangeable Parts

IRON BODY
150 lb. S. P.
"FERRENEWO"

BRONZE
200 lb. S. P.
"RENEWO"

In servicing the Bronze "Renewo" and Iron Body "Ferrenewo" Valves—both regular and plug types—only one stock of parts is required. All parts (except bodies and bonnet rings) are made exactly the same and fit each other perfectly.

Repairs are more quickly and easily made, ordering and handling are simplified. The result: Lower maintenance cost and low ultimate valve cost.

Lunkenheimer part-interchangeability is fully illustrated and described in Circular No. 567.

Ask your Lunkenheimer Distributor for a copy, or write direct.

Fig. 16
300 lb. S. P.
Bronze "RENEWO"

Fig. 16-P
300 lb. S. P.
Bronze Plug Type
"RENEWO"

VALVE MAINTENANCE SIMPLIFIED!

All parts of these valves (except bodies and bonnet rings) are exactly the same. They fit each other perfectly.

For example—if you need a stem, disc, or seat ring for the "RENEWO", you can use the corresponding part of the "FERRENEWO", and vice versa.

Thus there are fewer parts to be carried, repairs are more quickly and easily made. The labor, time, and expense of valve maintenance is cut down—'way down!

SAVE THIS WAY, TOO!

For severe throttling service, a regular type can be converted into a plug type, by simply changing the seat and disc, without taking the valve out of the line.

Thus it's not necessary to buy a whole new valve—just a matched set of plug type seat and disc which interchange perfectly in corresponding patterns and sizes in a range of pressures from 150 to 350 lb. S. P.

Lunkenheimer simplicity of design, minimum number of parts, and fine precision workmanship make this and other outstanding economies possible.

SEE YOUR LUNKENHEIMER DISTRIBUTOR!

Lunkenheimer Distributors are located in all industrial centers. There is one near you—have him demonstrate with actual samples the interchangeability of parts in "RENEWO" and "FERRENEWO" Valves. It's a big time and money saver for any plant!

THE LUNKENHEIMER CO., Cincinnati 14, Ohio
(OFFICES: NEW YORK 13, CHICAGO 6, BOSTON 10, PHILADELPHIA 7.
EXPORT DEPARTMENT: 318-322 HUDSON ST., NEW YORK 13, N. Y.)

000,000 bu. A recent revision of that estimate provides for a disappearance of 200,000,000 bu. for the crop year. Present indications in livestock feed circles are that wheat is being used at the rate of 250,000,000 to 300,000,000 bu. for the crop year. Very little can be done to divert this wheat to the flour mills when the wheat is being used as feed on the farms.

That point brings up the question as to how much millable wheat is still in the hands or under the ownership control of the growers. Weevil infestation of wheat is worse this year than usual. Also, wheat held on loans by Commodity Credit Corp. are subject to further holding by the growers through paying off the loans. Further, the continued shortage of freight cars and the reluctance of growers to sell wheat-on-hand, until a new crop seems assured, deter moving farm or country-held wheat to the flour mills.

Wheat for exports is the factor that is giving millers and users of flour the most concern. An early estimate by the Department of Agriculture indicated an export of 325,000,000 bu. As of January 1, that estimate was raised to 400,000,000 bu. on the basis of an export of 175,000,000 bu. during the past six months of 1945, and an anticipated export of as much as 225,000,000 bu. during the first six months of 1946.

On the basis of these revised estimates and industry survey findings, the headaches of the wheat millers are likely to increase and the July 1 carry over is likely to be dangerously low. In fact, it might be non-existent as an available carry over.

High Vitamin C Apple Discovered at Geneva

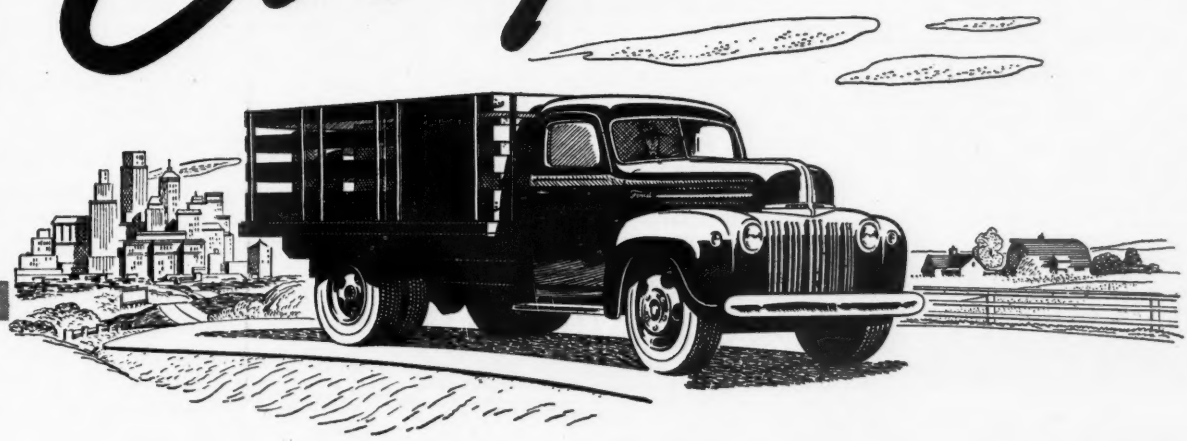
DISCOVERY of the high vitamin C content of Calville Blanc, an apple of European origin, fruiting on the grounds of the State Experiment Station at Geneva, has led to a heavy demand for propagating stocks which the experiment station is not able to meet.

So far as is known, the single tree in the station orchard is the only specimen of the variety in the United States. Propagation of the variety has begun, but it will be two or three years before any stock will be available, say station officials.

Interest in Calville Blanc centers around the discovery that it contains, on the average, 37 milligrams of vitamin C in each 100 grams of fruit, or about each three and a half ounces. "This means that a five-ounce Calville Blanc apple will sup-

Ford

FORD TRUCKS Everywhere!



✔ 32 IMPORTANT New ENGINEERING ADVANCEMENTS

•

✔ 51 BODY AND CHASSIS COMBINATIONS

•

✔ TWO GREAT FORD ENGINES— THE 100 H.P. V-8 and the 90 H.P. SIX

because of

LOW INITIAL COST

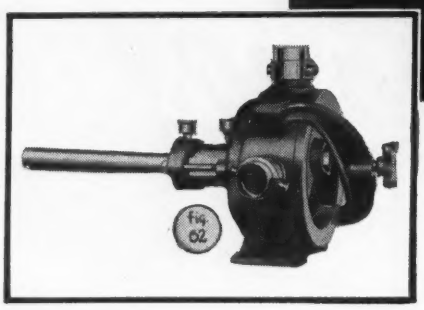
LOW OPERATING COST

LOW MAINTENANCE COST

Availability of Service and Parts— Everywhere, Quickly

SEE YOUR FRIENDLY FORD DEALER

VIKING Says "NO"



So You Will Say "YES"

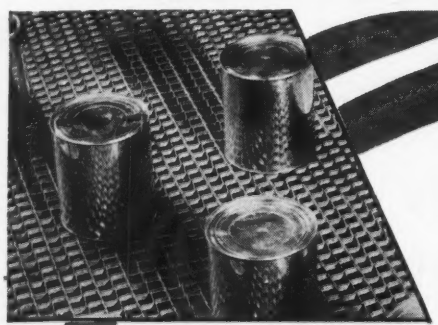
In spite of the rush of producing pumps for rebuilding industry on a peace-time basis, Viking still knows how to say "No" when it comes to manufacturing rotary pumps.

All parts undergo rigid inspection to insure that pre-war standards of quality are maintained. There is no sacrifice of quality. When Viking says "No" to parts coming through the line it's you they are thinking of and it's you who will continue to say "Yes". Viking is a pump that places quality above everything else.

Write for free Bulletin Series 46SE today. It will give you the latest information on Viking rotary pumps.

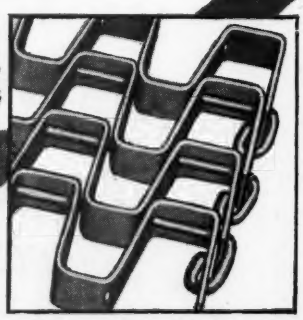
See Our Catalog In SWEETS

VIKING PUMP COMPANY
CEDAR FALLS, IOWA



MODERNIZE CONVEYING with LA PORTE

FLEXIBLE STEEL CONVEYOR BELTING



Engineered to today's processes, this modern steel belting can be used in all of the newest methods of canning, dehydrating and freezing. Steam, acids and extreme temperatures do not harm it. Steel mesh feature allows circulation of air and liquids around products in process; also facilitates cleaning and sterilizing with steam gun or hot water. La Porte belting will not stretch, weave, creep, nor jump. Its rugged construction assures long, economical service and low maintenance costs. No special dressing or belt lacers needed to keep it at peak efficiency.

Ask your Supplier today. Available in any length and practically any width.

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

ply about three-fourths of the daily allowance of vitamin C for an adult as established by the National Research Council," says Professor G. H. Howe, in commenting on the variety in the current issue of "Farm Research," the station's quarterly magazine. By comparison, oranges supply from 35 to 55 milligrams, grapefruit from 35 to 40, and tomato juice from 20 to 30 milligrams. Most of the apples tested by the station food chemists ranged below 15 milligrams to the 100 grams of fruit and several of the better-known sorts contained less than 10 milligrams.

World Decline Forecast For Sugar Production

A 400,000-TON decrease in world sugar production in 1945-46 compared with the year before is forecast by the United States Department of Agriculture's Office of Foreign Agricultural Relations.

The total world output of beet and cane sugar in 1945-46 is estimated at 27.8 million short tons, raw value. This compares with the 1944-45 total of 28.2 million tons, and is 2.7 million tons less than in 1943-44 and 6.5 million tons below the 1935-39 average.

World production of beet sugar in 1945-46, estimated at 7.3 million short tons, is expected to be the smallest since 1923. North America's beet sugar output trend has been upward since 1943, but Europe's has been downward.

DDT for Jap Beetles Shows Early Promise

THE use of DDT to aid in the control of Japanese beetle larvae in the soil shows much promise as a substitute for arsenate of lead in tests now being carried on in the Hudson River Valley by Dr. J. A. Adams, entomologist of the State Experiment Station at Geneva, N. Y.

"In southeastern New York and in other areas where the Japanese beetle is prevalent, extensive areas of turf have been treated by applying large amounts of arsenate of lead," says Doctor Adams. "Although as much as 1,000 to 1,500 lb. per acre of arsenate of lead were formerly used, investigations have shown that the minimum dosage is from 435 to 500 lb. applied every five years."

The cost of this treatment is high and the material has certain harmful effects on seedlings and shallow-rooted plants, it is explained. Furthermore, the use of arsenate of lead is not recommended for pastures nor for land that is to be used within a

WORTH REMEMBERING

see Fairbanks-Morse FIRST FOR SCALES

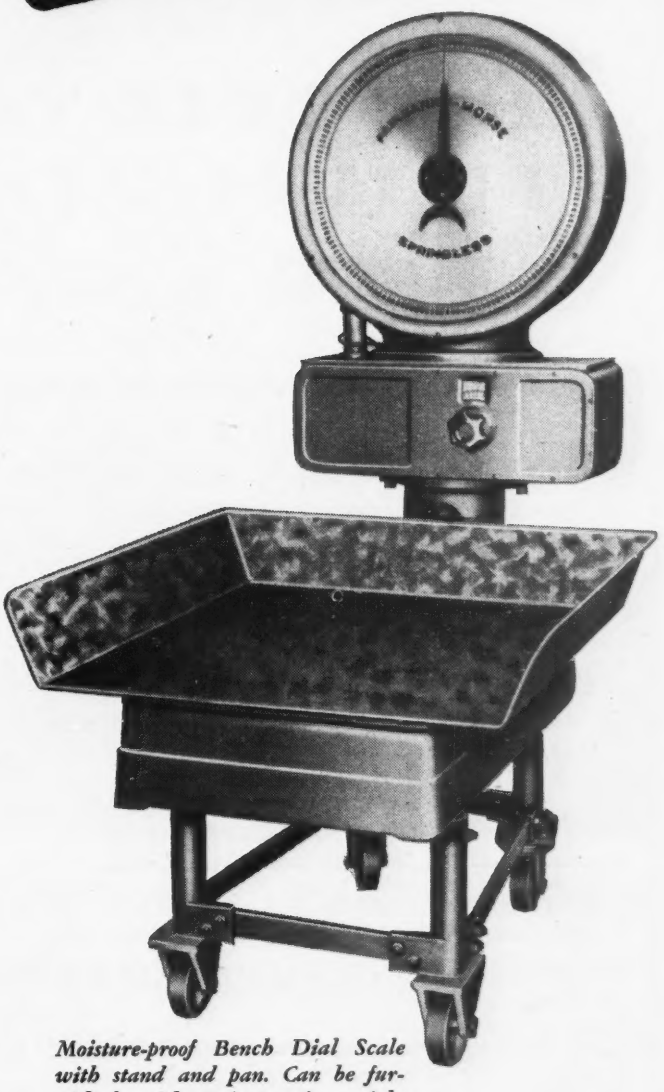
ABOVE and beyond every other requirement, accuracy is what you demand most in scales. Accuracy is what you *get* in all Fairbanks-Morse Scales.

It's an enduring accuracy based on the superior workmanship and know-how that comes only with long, scale-building experience.

Every Fairbanks-Morse Scale is made to do a superior job—to work carefully and surely, to count, to print weigh-records and receipts, to weigh products even while moving.

As in every industry, there are dependable Fairbanks-Morse Scales to render faithful, accurate service for you.

Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago 5, Illinois.

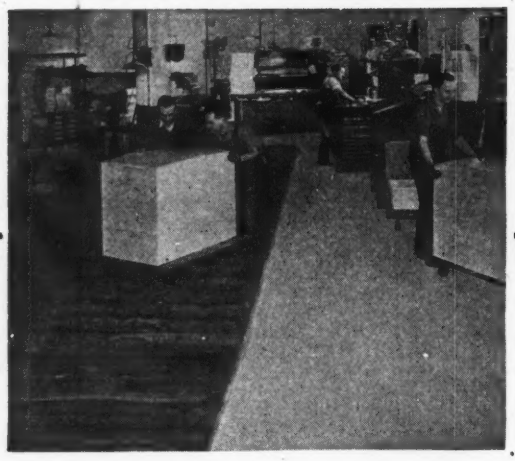


Moisture-proof Bench Dial Scale with stand and pan. Can be furnished with Printomatic weight recorder.

Fairbanks-Morse

A name worth remembering

Diesel Locomotives • Diesel Engines
Scales • Motors • Pumps • Generators
Magnetos • Stokers • Railroad Motor Cars and Standpipes • Farm Equipment



What DOES THIS PICTURE MEAN TO *You?*

The old wooden floor means hard work, delays, accidents.

The STONHARD RESURFACER overlay means smooth, easy trucking, more rapid movement of materials, safety.

The most convincing demonstration of these truths can best be made on your own floors.

We invite you to try STONHARD RESURFACER on the basis of our liberal 30-day trial offer.

FILL OUT AND RETURN THIS COUPON NOW

STONHARD COMPANY
888 Terminal Commerce Bldg., Philadelphia 8, Pa.

☐ Please send us a drum of STONHARD RESURFACER for 30-day trial.

☐ Send us more information about STONHARD RESURFACER.

Firm .....

Mr. ..... Title .....

Address .....

City ..... Zone ..... State .....

STONHARD COMPANY

Building Maintenance Materials • Since 1922

888 Terminal Commerce Bldg., Philadelphia 8, Pa.

period of several years for growing vegetables, potatoes, and other food crops.

Preliminary tests made with DDT used at the rate of 25 lb. to the acre reveal that this treatment is as effective as a 500-lb. application of lead arsenate. DDT is believed to be no more toxic to warm-blooded animals than equal amounts of arsenate of lead. In addition only one-twentieth as much poison need be added to the soil so that food crops probably could be grown on DDT-treated soil with safety much sooner than where arsenate of lead is used.

Tomato Plants Produce Own Disease Resistant

A SUBSTANCE that inhibits the growth of many disease-carrying fungi, while remaining almost as active as penicillin against staphylococcus, has been extracted from tomato vines by chemists in the Department of Agriculture.

Obtained only in laboratory cultures to date, there is no evidence as to how the substance will work in the human system or even against superficial fungus infections.

The chemists found tomatin present in all tomato plants except those that had already wilted from "wilt disease." The present thesis is that it is probably more abundant in the resistant ones.

SCHEDULE OF EVENTS

FEBRUARY

3- 8—Food Processors, annual meeting, Convention Hall, Atlantic City, N. J.
National Canners.
National Dehydrators.
National Pickle Packers.
National Frozen Food Packers.
National Preservers.
National-American Wholesale Grocers.
National Food Brokers.
Canning Machinery and Supplies.

19-21—Michigan State College, technical school for pickle and kraut packers, East Lansing, Mich.

21-22—Ozark Canners Association, 38th annual meeting, Colonial Hotel, Springfield, Mo.

25-Mar. 2—Chemical Industries, 20th exposition, Grand Central Palace, New York.

MARCH

8—Canners League of California annual meeting, Fairmont Hotel, San Francisco.

11-14—American Society of Bakery Engineers, national meeting, Edgewater Beach Hotel, Chicago.

18-20—Institute of Food Technologists, 6th annual meeting, Statler Hotel, Buffalo, N. Y.

20-22—Chicago Technical Societies Council, production show and conference, Stevens Hotel, Chicago.

25-26—Associated Retail Bakers of America, national convention, Sherman Hotel, Chicago.

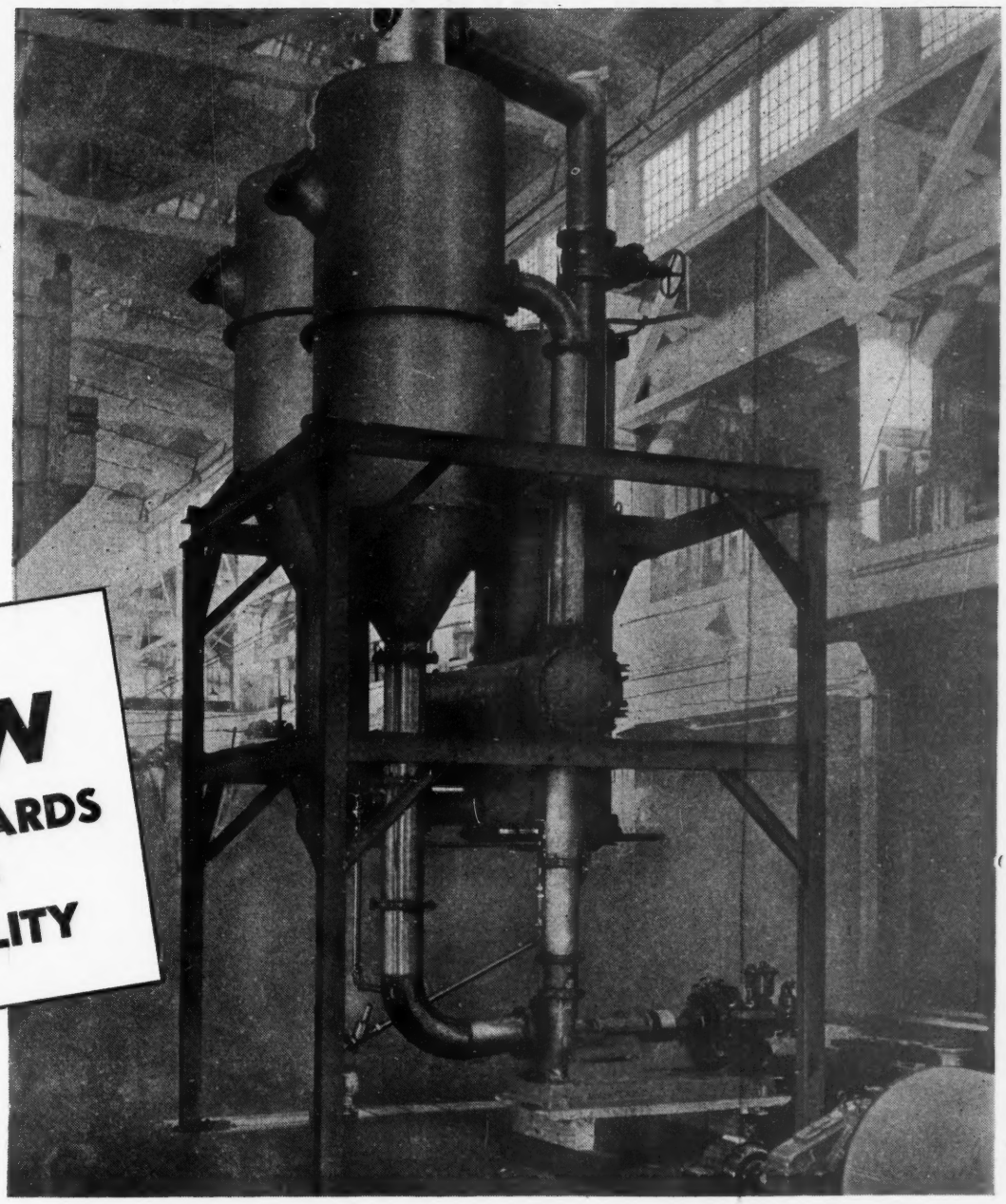
27-31—Frozen Foods Institute, 5th annual exhibit Park Ave. Armory, New York.

APRIL

2- 5—American Management Association, packaging exposition, Public Auditorium, Atlantic City, N. J.

24-26—Industrial Packaging Engineers Association of America, exposition, Sherman Hotel, Chicago.

25-27—National Fisheries Institute, first annual meeting, Continental Hotel, Chicago.



NEW STANDARDS OF QUALITY

Buflovak VACUUM FOOD PRODUCTS EVAPORATORS

New standards of quality are assured with Buflovak, the Evaporators that are so thoroughly meeting the exacting requirements for producing concentrated food products (fruits, juices, vegetables, milk).

Better quality is assured by rapid evaporation, continuous production, and immaculate cleanliness.

Your food products *maintain* high quality, natural flavor, good color, smooth, uniform texture, and good body!

Buflovak Evaporators are built in sizes and types to meet every operating condition, including multiple effect, that saves 50% in steam and cooling water!

Illustrated above is an installation photograph of Buflovak's Vacuum Evaporator. The liquid passes into the Evaporator, passes rapidly through the heating tubes and is quickly discharged, in continuous operation, as a finished product!

Other Buflovak products include: Atmospheric and Vacuum Dryers, Heaters and Coolers, By-Product recovery and Distillation Equipment, Kettles, and Stills. For further details refer to Food Industries 1945 Catalogs and Directory or write us direct.

BUFLOVAK EQUIPMENT DIVISION OF BLAW-KNOX CO.
1631 Fillmore Avenue
BUFFALO 11, N. Y.

MERCOID CONTROLS

Mercoid Controls are first choice among leading engineers throughout industry. They are used on industrial applications involving the control of temperature and pressure. Available in various ranges. Controls also for liquid level, etc.

Hermetically sealed mercury switches used exclusively in all Mercoid Controls. They are not affected by dust, dirt or corrosion, thereby assuring better control performance and longer control life. Complete catalog sent upon request.

MADE BY THE MERCOID CORPORATION
4221 BELMONT AVE. CHICAGO 41, ILL.

INDICATORS

Production

Flour production in December practically equalled November, totaling 15,582,168 sacks, compared with 15,595,864. The output, however, was 954,638 sacks over December, 1944, production, according to the Northwestern Miller, whose figures represent 73 percent of the flour produced.

Chicks produced in November, came to 39,339,000, the largest output on record for that month, and 27 percent larger than the 30,985,000 hatched in November, 1944. The previous high for the month was the 35,394,000 produced in November, 1943.

Pig crop in 1945 numbered about the same as the total crop in 1944, 86,714,000 head and 86,668,000 respectively. While the 1945 fall crop was 12 percent above the 1944 fall crop, it served only to balance the 7 percent drop in the spring crop.

American cheese production in November was estimated at 44,875,000 lb., 8 percent lower than in November, 1944, but 27 percent above the ten-year average.

Pork production in Federally inspected plants, in December, showed an increase of 25 percent over November, while the lamb increase was 7 percent according to the American Meat Institute. Beef and veal, however, show a decrease for December of 20 and 29 percent respectively. Because of the heavy pork increases, lard production for December was 22 percent above November.

Macaroni and noodle products, for 1945, totaled 1,070,000,000 lb., according to Glenn G. Hoskins. This represents an index of 158 percent over the base pre-war years, 1937-41, which averaged 677,614,000 lb.

Butter production in November, estimated at 69,030,000 lb., represents a 22 percent decrease from October and compares with a seasonal decline of 15 percent both in November, 1944, and the ten-year average.

Canned evaporated milk production in November is estimated at 165,000,000 lb., 22 percent less than the November, 1944, output and 2 percent less than the five-year average. Production for the year, through November, however, is still 13 percent larger than the output for the same 1944 period, totalling 3,613,901,000 lb.

Canned condensed milk production for November was 6 percent larger than in November, 1944. Estimated at 9,300,000 lb., the output is 51 percent larger than the five-year November average. Total production for the first eleven months of 1945 was 135,264,000 lb., an increase of 4 percent over the corresponding 1944 months.

In Storage

Cooler occupancy declined from 64 percent on December 1, to 61 percent on January 1. Freezer occupancy, January 1, was 85 percent, the same as on December 1. January 1 fruits and vegetable stocks decreased, with apple holdings only about half the quantity in storage Jan. 1, 1945. Meat stocks in cold storage came to 611,000,000 lb., an increase over December 1, but well-below average, beef with 180,000,000 lb., being the only meat above average supply. The storage outlook thus indicates ample cooler space available, with occupancy lower than at any time since May, 1943.

Canned peas in canners' hands on December 1 were equal to 8,914,000 cases, basis No. 2's, compared with 4,921,000 cases on the same date last year, according to the National Canners Association. This was from a total civilian supply of 35,898,000 cases from the 1945 pack, which almost doubled the previous year's civilian output.

Canned corn stocks for civilian supply totaled 12,327,000 cases in December 1, compared with 7,495,000 a year earlier. According to the National Canners Association, this remains from a 1945 civilian pack of 27,636,900 cases, which compares with the 18,329,000 case supply in 1944.

Indexes

Wholesale price of foods compiled by the New York Journal of Commerce stood at 110.6 for the week ending January 19, compared with 112.5 for the December monthly average and 109.4 for January, 1945.

Average activity index of Business Week was 174.5 for the week ending January 19, as against 171.7 a month earlier and 231.3 a year earlier.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded January (thousands)	Total Awarded 1946 (thousands)
Bakery	$ 90	$ 615	$ 615
Beverages	2,170	1,501	1,501
Canning and Preserving	....	340	340
Cold Storage	272	759	759
Confectionery	40	100	100
Grain Mill Products	195	1,305	1,305
Ice, Manufactured	....	....	....
Meats and Meat Products	....	40	40
Milk Products	235	747	747
Miscellaneous	500	757	757
Complete 1946 totals	$3,502	$6,164	$6,164

Check Spoilage Losses

G-E GERMICIDAL LAMPS DESTROY BACTERIA AND MOLD SPORES THAT REDUCE YOUR PROFIT

Here's a simple answer to your contamination problem. Merely install G-E Germicidal Lamps to destroy the invisible germs and mold spores that cause your losses. These new lamps kill the offending organisms in the air before they can taint your product. In the illustration the lamps are placed under the hoods to radiate on the fruit.

Many food handling firms already employ G-E Germicidal Lamps to protect their products from spoilage. They report greater customer acceptance of their product and dramatic reduction or complete elimination of spoilage losses.

Use G-E Germicidal Lamps to protect these products:

- **Meat**
- **Vegetables**
- **Fruit**
- **Soft drinks**
- **Beer**
- **Sugar**
- **Bread**
- **Pharmaceuticals**

Four sizes of G-E Germicidal Lamps, 4, 8, 15 and 30-watts, are adaptable to your protection problem.

May we give you more information on the applications of G-E Germicidal Lamps in protecting your product? Write to General Electric Co., Nela Park, Cleveland 12, Ohio, for a copy of "The Lamp That Kills Germs."

G-E LAMPS

GENERAL ELECTRIC

Basco-TEX

PLASTIC APRONS!

Will Not Crack or Peel

WATER-PROOF, ALKALI-PROOF, STAIN-PROOF, ACID-RESISTANT, OIL-RESISTANT

NO LAUNDERING
Save their cost over and over again!

TOPMOST PROTECTION
Far greater safeguard to clothing than ordinary aprons!

AMAZING STRENGTH
Plus lightness in weight for utmost wearing comfort!

4 COLORS — 4 SIZES

PRICES — SIZES — COLORS

GRAY
27 x 36...$8.40 per doz.
30 x 36... 9.78 per doz.
36 x 40...11.90 per doz.
36 x 44...12.60 per doz.

Full Length Sleeves $9.66 per dozen pair

Leggings, Hip Length $11.90 per dozen pair

BLACK
27 x 36...$8.40 per doz.
30 x 36... 9.78 per doz.
36 x 40...11.90 per doz.
36 x 44...12.60 per doz.

Full Length Sleeves $9.66 per dozen pair

Leggings, Hip Length $11.90 per dozen pair

ALL WHITE
27 x 36...$6.88 per doz.
30 x 36... 7.65 per doz.
36 x 40... 9.35 per doz.
36 x 44...10.18 per doz.

Full Length Sleeves $7.15 per dozen pair

HEAVY DOUBLE COATED MAROON NEOPRENE
27 x 36..$10.61 per doz.
30 x 36.. 12.60 per doz.
36 x 40.. 16.50 per doz.
36 x 44.. 18.45 per doz.

Full Length Sleeves $12.90 per dozen pair

Leggings, Hip Length $23.50 per dozen pair

All Prices F.O.B. Chicago. Furnish best priority. Minimum order 1 dozen.

ORDER BY MAIL OR PHONE TODAY
Free Sample Swatch on Request

ASSOCIATED BAG & APRON CO.
218 West Ontario Street, Chicago 10, Ill.
Phone SUPerior 5809

What Washington Thinks

By R. S. McBRIDE, Washington, D. C.

TRADE AIDS—International conferences begin this spring among 14 important countries invited by the State Department to discuss means for increasing trade among those nations and the United States. State Department spokesmen point out that they expect this conference to lay the basis for reducing further the tariff and trade barriers of other nations as well as those of the United States. Industries wanting greater imports are pleased. Those worried about competition of goods from low-cost labor areas of the world are worried.

"FACT" FINDING—Neither industry spokesmen nor outstanding labor leaders wholly like the Presidential theory of fact-finding as a basis of settling labor disputes of national significance. The mild acceptance of the principle by labor was not stimulated when the fact-finders in the General Motors case reached conclusions nearer to the company claims than to the requests of labor. But basically, the business critics oppose the plan because they say that the system does not find facts. At best, such a committee discussing future wages and ability to pay, or expected cost of living, is in the forecasting business, rather than actually fact-finding.

SCARCE CASEIN—All milk products are experiencing difficult competitive relationships, both among themselves and in comparison with other food and non-food commodities. Department of Agriculture summaries of the casein situation show that this milk by-product is no exception. Domestic production is at a record low level and even moderately heavy imports are failing to maintain needed stocks. Processing of milk has become so successful that the competitive demand for raw material now forces difficult problems for all divisions of the industry. Washington sees no hope for improvement so long as national income is high and business activity good.

"PORK" FOR SCIENCE — The clamor for a National Science Foundation, first stirred by atomic bomb achievements has tapered off in Washington. It is evident there that one cynic was right in his view of the situation. He noted that the present principal advocates of that program are the professors who want subsidy for science students or funds allotted for their favorite research projects. The need for Federal aid in science is probably not less. But there is danger that a narrow basis for support of this undertaking may give the whole project the appearance of being a pork barrel for professors of science.

ANTIFREEZE — Food technologists are making antifreeze scarce in the United States. This shows the ramification of science and the interdependence of modern industry. The development comes about this way. We now can recover with profit, much more sugar from molasses than formerly. Industrial demands for molasses as a fermentation medium for other than alcohol have been increased. Thus, cheap molasses is no longer available to make cheap denatured alcohol for the motor car radiator. Synthetic chemistry has come to the rescue with huge new supplies of methanol, which is very successful as an alternate if one does not choose a non-evaporating antifreeze like glycol.

FAT DIVERSION — Washington wails that the price relations which attracted butterfat into fluid cream, ice cream, and other dairy markets is causing the butter scarcity. To attract the fat back into butter the first proposal was to raise the butter price, a recommendation that roused a storm of housewife and congressional criticism. The Department of Agriculture refuses to consider the idea that they might rescind the earlier price increases which caused the distortion. Or, they might even throw the whole dairy products business open so that the normal laws of supply and demand

CHANGE OF ADDRESS

DIRECTOR OF CIRCULATION, FOOD INDUSTRIES
330 WEST 42nd STREET, NEW YORK 18, N. Y.

Please change the address of my Food Industries subscription.

Name .....

Old Address .....

New Address .....

New Company Connection .....

New Title or Position .....

can function. Such easy solutions are not politically attractive as they do not promise to attract votes.

TECHNOLOGISTS SCARCE — An outstanding director of food research of the government complains that industry is taking his best scientists to work in the research departments of business. Apparently industry is beginning to appreciate the profit value of food technologists.

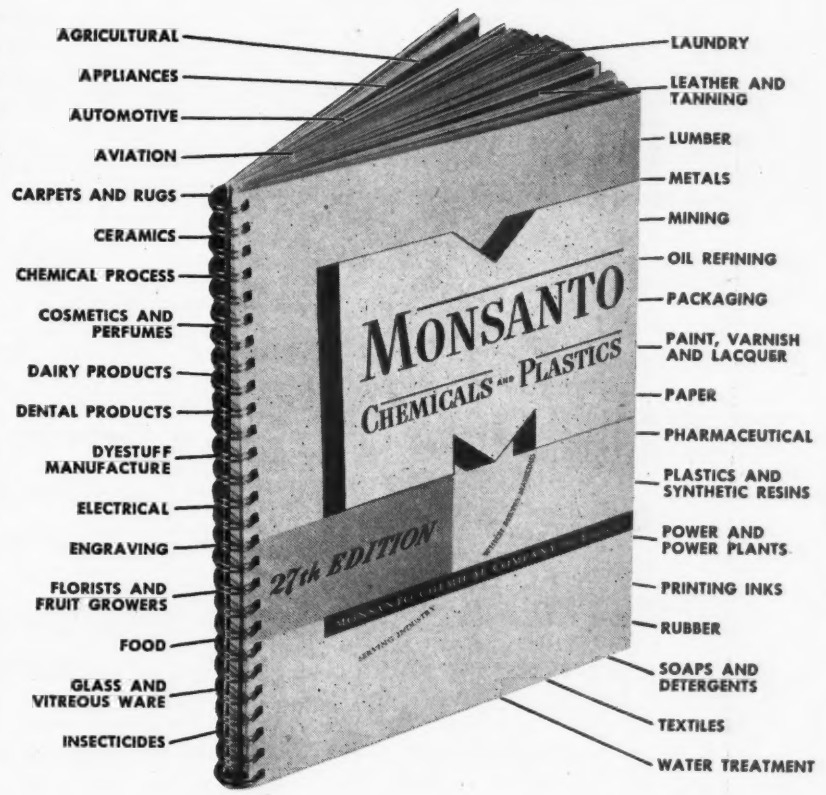
WHICH VEGETABLE — "Commercial freezing, which now takes less than 2 percent of all commercially grown vegetables, is expected to grow rapidly so that within the next 10 years frozen vegetables may offer strong competition to fresh vegetables at retail. However, canning, which now takes about 40 percent of the commercially grown vegetables, will continue to be the major form of processing vegetables for many years to come." This is an official forecast of the Department of Agriculture. One is entitled to wonder whether the changes in food technology, which occur so rapidly these days, may not upset some of this long-term guessing.

INSECTICIDE BILL—The Department of Agriculture has made known to Congress the drastic revision that it would like to see in the law under which Uncle Sam regulates insecticides, fungicides, and other economic poisons. Any food technologist interested in improving the supply of farm and garden materials available for processing will find that this proposed law has significance for him.

CHEAP MONEY—Every Washington indication continues to emphasize that Uncle Sam is going to keep the rates of interest on loans at a very low level. No longer can one run down to Washington and borrow money casually for food projects. But the Washington influence will certainly encourage every commercial banker in making such loans to any enterprise that promises to make a profit out of modernization or enlarged factory facilities. If technologists can find ways in which to save labor cost by investment of new money in the plant, they will be encouraged by the banker and should be complimented by their own management.

IN PLACE OF BREAD—Forecasts by the government that the per capita consumption of vegetables is bound to continue high may have an ominous meaning for the baking industry. If these sources of bulk food are consumed at new record levels, perhaps 30 percent above the rate of 10 years ago, some other bulk food must give way. The habits of man will limit the bulk of the intake. And bread is the item that in the past has yielded space in the stomach for the vegetable and salad foods as they increased in interest for Mr. and Mrs. Average.

NEW and now available



If you are identified with any of the above 34 industries, this new and complete Monsanto Catalog should be on your desk . . . It contains 214 pages of valuable, detailed information on more than 400 Monsanto Chemicals and Plastics — a daily guide of definite help to everyone whose thinking is geared to increased production, greater economies, better methods and improved product salability . . . Send for your copy today . . . Fill in and mail the coupon, or write: MONSANTO CHEMICAL COMPANY, 1700 South Second Street, St. Louis 4, Missouri.

FILL IN AND MAIL THE COUPON

MONSANTO CHEMICAL COMPANY
Department 213-A
1700 South Second Street
St. Louis 4, Missouri

Please send immediately copy of your new Monsanto Catalog to

Name.....

Title.....

Company.....

Street.....

City.....*Zone*....*State*.....

VODOL

Corn Oil Lecithin

STABILIZER • ANTIOXIDANT • EMULSIFIER *(as agent)*

Natural Phosphatide extract of corn oil, perfected by our process

Qualities of VODOL

Conclusively demonstrated by leading users in

PACKING INDUSTRIES
BAKING
CONFECTIONS
MARGARINE
DRUGS & COSMETICS

Use Coupon below for liberal FREE Samples of VODOL. Try it! Let your own tests decide.

Refining Unincorporated
407 S. Dearborn St., Chicago 5, Ill.

Send us samples of VODOL.

Name_____

Position with Firm_____

Firm Name_____

Address_____

_____

Remarks_____

_____

VODOL has rapidly gained a position of high preference among users of lecithins, from the largest to the smallest processors and producers. Reasons for this choice of VODOL are found in RESULTS THESE USERS HAVE ARRIVED AT, IN THEIR OWN TESTS AND COMPARISONS. The following qualities of VODOL are convincingly attested:

VODOL is absolutely neutral as to *Odor* and *Taste* in end use

This is the unanimous finding in hundreds of comparative proof tests. As an outstanding characteristic, it establishes VODOL as a prime essential for products of the most exacting standards.

Instantly soluble at low temperatures. VODOL does not require pre-heating, pre-dissolving, straining nor thinning.

VODOL pours freely. Is easily handled. Disperses in liquid, solid, or semi-solid fats. When used in margarine, VODOL does not darken under normal frying temperatures.

VODOL IS AVAILABLE FOR IMMEDIATE SHIPMENT IN DRUMS OF 500 LBS., 50 LBS., AND 25 LBS. ★★★ SMALLER PACKAGES BY ARRANGEMENT.

Exclusive Product of

REFINING UNINCORPORATED
407 S. Dearborn St., Chicago 5, Illinois

FROM REPORT OF A LEADING LABORATORY

Straight dough bread made up to contain 4% shortening with **VODOL** added to replace 1.5% of shortening.

Addition of **VODOL** gave softer loaf when fresh, and softer loaf **42 HOURS AFTER** baking. Softness as revealed by test is expressed in Millimeters and represents compressibility of a slice under load in 10 seconds. The softer the bread, the greater the compressibility. Results:

Test for Freshness

Oven No.	1	2	3	Av.
Fresh: No VODOL	93	90	89	91
FRESH: VODOL	109	104	93	102
42-hr. old bread: No VODOL	26	26	33	28
42-hr. old bread: VODOL	42	47	48	45

MEN • JOBS • COMPANIES

INDUSTRY

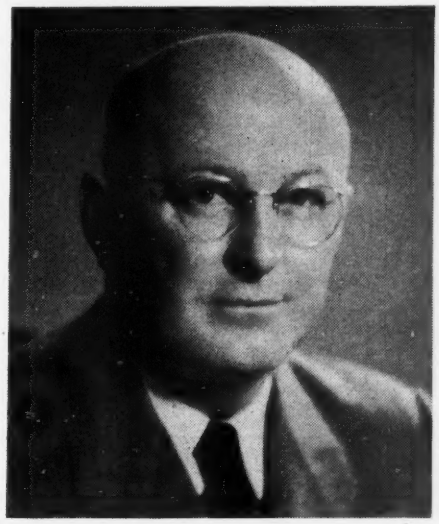
B. & B. Ice Cream Co., Inc., Norwood, Ohio, plans to build a new one-story plant in Cincinnati. The structure will contain general offices, an ice cream processing department and a retail sales unit.

The Borden Co., through its president, Theodore G. Montague, has announced its intention to spend approximately $23,000,000 in 1946 for extension and improvement.

Butler Packing Co., Seattle, Wash., plans immediate construction of a $1,000,000 packing plant in Oakland, Calif. The company has announced that it will add several tomato specialties to its line, at the Oakland plant.

California Packing Corp., San Francisco, has announced plans to establish a packing plant in Findlay, Ohio, for the purpose of canning tomatoes, corn, lima beans and peas. According to L. S. Argall, manager of the company's midwest division, cost of the project will be from $1,000,000 to $1,500,000.

Chef Boy-Ar-Dee Quality Foods, Inc., Milton, Pa., is planning a broad expansion program to include a new laboratory, flour elevator and equipment. The laboratory will extend its services to the farmers of the region, who will be able to obtain soil analyses, acidity and fertilization tests, as well as benefits from experiments on vegetable disease control. Announcement was made by Carl A. Colombi, executive vice-president of the firm.



W. L. KRUPPENBACHER

Formerly executive vice-president of Mars, Inc., Chicago, W. L. Kruppenbacher has been elected president and chairman of the board, succeeding the late Ethel V. Mars.

Gangi Bros., Santa Clara, Calif., has awarded a contract for construction of a new $100,000 tomato cannery. The plant is expected to be in operation this year.

Hiram Walker & Sons, Inc., Walerville, Ont., has announced that it will enlarge its distillery by expanding more than $2,500,000 for new buildings and equipment.

Mason, Au and Magenheimer, confectionery manufacturing company, Brooklyn, N. Y., has purchased 33 acres in Mineola, N. Y., on which it plans to erect a new factory.

Maxson Food Systems, a division of The W. L. Maxson Corp. of New York, has announced its forthcoming entrance into the frozen seafood field. The company plans to operate a plant on the New England coast where it will precook and quick-freeze swordfish cakes, saute scallops, soft shell crabs, clam chowder, fried oysters and clams and other seafood items.

Megowen-Educator Food Co., through its president, R. L. Megowen, has announced the purchase of property in Lowell, Mass., which will be used in connection with the expansion program of the company.

Pacific Can Co. will construct a $1,000,000 combination cannery and can manufacturing plant at San Leandro, Calif. The cannery, scheduled for completion by June 1, will be operated by the Oakland Canning Co. According to E. F. Euphrat, president of Pacific Can Co., the joint production schedule of the plant is expected to be 2,500,000 cases of fruits and vegetables annually and 2,000,000 cans daily.

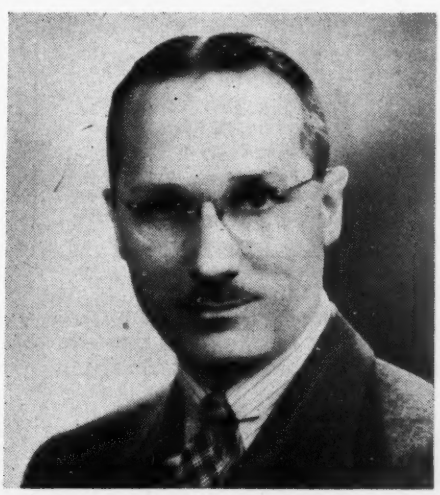
Paragon Fishing Co. has added to its line of canneries and fishery installations in Washington and Oregon by opening a plant in Portland for the manufacture of fish cakes.

Portales Valley Mills, Portales, N. Mex., peanut oil processing plant, recently lost by fire its mill, processing machinery and 15 carloads of raw peanuts.

Red Top Brewing Co., Cincinnati, Ohio, has purchased the Clyffside

ROY K. DURHAM

Millers' National Federation, Chicago, has appointed Roy K. Durham director of its technical service. Mr. Durham has been production superintendent of Rodney Milling Co., Kansas City, for many years.

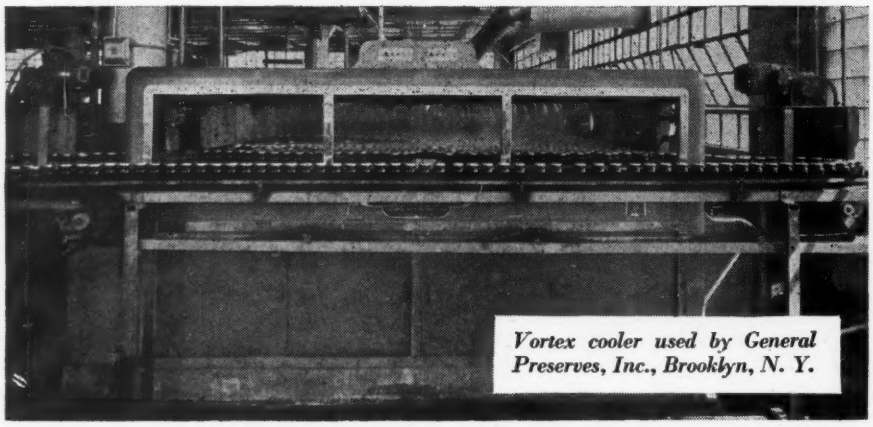


DR. DARRELL ALTHAUSEN

Fritzsche Brothers, Inc., New York, manufacturer of essential oils, has appointed Dr. Darrell Althausen as head of the company's new products department. He will be located at the Clifton, N. J., laboratories.

WILLARD ELIEL

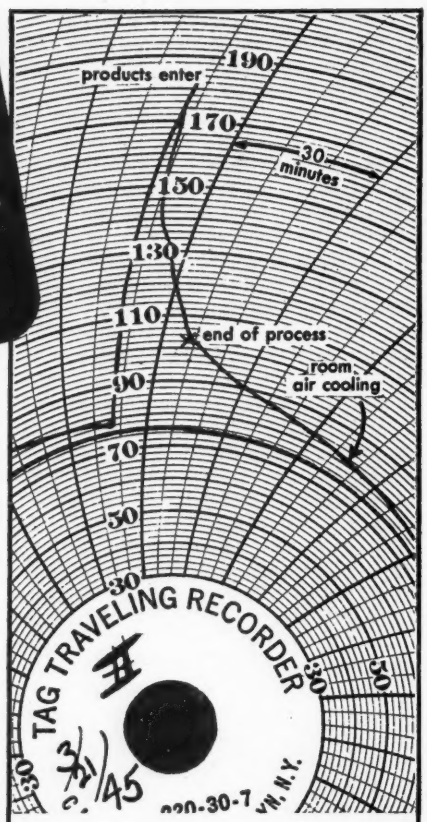
Identified with production activities of College Inn Food Products Co., Chicago, for 23 years, Willard Eliel recently has been made executive vice-president of the company, succeeding Dwight Maham.



Vortex cooler used by General Preserves, Inc., Brooklyn, N. Y.

Your Hot Packaged Foods Deserve

VORTEX Automatic Cooling



The process recorded above is cooling 1 lb. hot marmalade jars 80° F. within 20 minutes to packing temperature.

Automatic cooling of your products deserves scientific treatment to preserve the original flavors and clarity by *positive* control of time and temperature.

The Vortex system is entirely automatic in operation and can be run continuously without operators, requiring only routine maintenance. The heat exchange medium is atomized water, distributed over the containers in such a manner that maximum cooling is achieved with a minimum quantity of water.

Vortex coolers are widely adaptable to individual requirements and have an almost limitless capacity range for all sizes of jars, bottles or cans. The use of these machines greatly conserves floor space and allows for immediate labeling and packing. A rapid drying system can be supplied with the discharge conveyors, if desired.

Whatever your problem of cooling—or heating—your products, it will pay you to learn the Vortex method of achieving uniform results economically. Send us your process requirements and write for bulletin No. 87 today.

BARRY-WEHMILLER MACHINERY CO.

1946 . . . Our 61st Anniversary St. Louis, Mo., U.S.A.

Brewing Co. of the same city. The acquisition includes stocks, physical properties, brand names and trade marks. Louis Ullman is president of Red Top.

PERSONNEL

H. E. Apple, Jr., Rochester, N. Y., has been elected president of the Association of New York State Canners. Other officers elected are: E. E. Burns, vice-president and H. J. Torrey, treasurer.

Maj. Howard G. Boerner has been appointed to supervise the marketing of a new line of specialty food products for Florida Foods, Inc., Boston. Prior to his entry into the armed forces, Major Boerner was division sales manager of the Birdseye-Snyder Division of General Foods Corp.

Lt. Robert Couch, formerly with the Packaging Branch of the Quartermaster Subsistence Research and Development Laboratory, Chicago, has joined the packaging division of General Foods Corp., New York.

William P. Fay, former sales promotion manager of General Food Sales Co., institution products, has been appointed vice-president in charge of sales, merchandising and promotion for the midwestern territory of Snow Crop Frozen Foods. He will make his headquarters in Chicago.

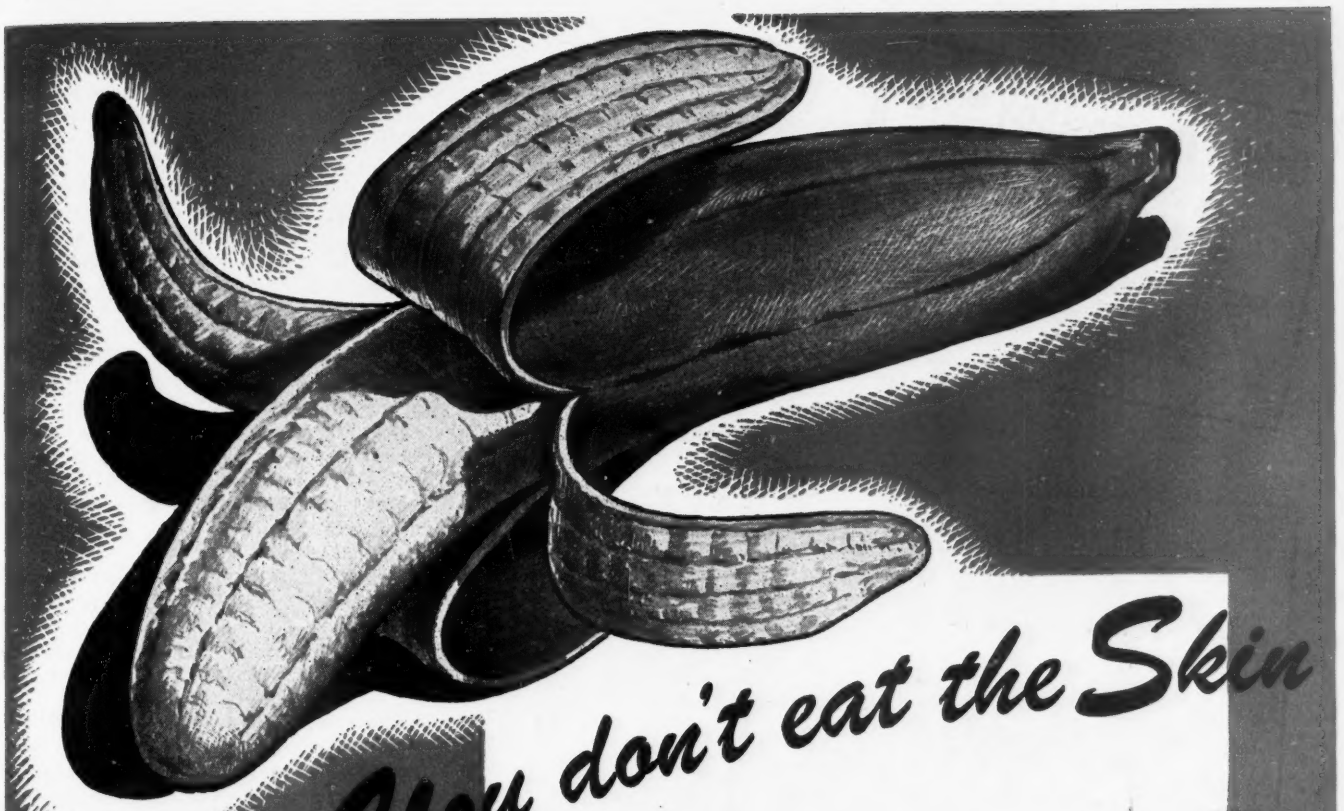
Martin J. Gerrits, who has been sales director of Valier and Spies Milling Co., St. Louis, Mo., is now manager of the bakery department of the H. A. Smith Stores, Port Huron, Mich.

Maj. G. V. Hallman, Quartermaster Corps, formerly in the research department of Continental Can Co., Chicago, has been transferred from Sidney, Australia, to Berlin, Germany, where he is in the Control Commission (American Zone).

Dr. Frederick W. Hayward, associated with the New York State Experimental Station at Geneva, N. Y., for the past nine years, has joined the staff of the Industrial Research Institute of the University of Chattanooga, where he will specialize in research on foods.

Col. David Henry, formerly Commandant of the Subsistence School of the Chicago Quartermaster Depot, Chicago, is now with the dairy and poultry section of Armour and Co., Chicago.

Dr. Edward L. Holmes has been appointed to head up the sanitation program of the American Institute of Baking, Chicago. For the past ten years, Dr. Holmes has been associated with the Food and Drug Administration, and joins the Institute directly



You don't eat the Skin

WHEN YOU EAT A BANANA

And for the same reason there isn't any point in loading your products with a lot of hulls, sticks, impurities and waste material, when it's the true spice flavor you want.

At Stange we call this waste material "exhausted" pepper, cloves, or cinnamon, as the case may be. We throw tons of it away every year because it has no flavoring value in your food products.

We start with spices in their natural form—yes—but in our exclusive process of extraction, we get ALL the flavor in a concentrated, easy to use form. All foreign matter is disposed of, leaving in Cream of Spice seasonings *only* the true, full spice flavor that *always* has the *same degree of strength.*

To get TRUE flavor—ask for Stange's C.O.S. (Cream of Spice) Seasonings.

Stange's
CREAM OF SPICE

• WM J. STANGE CO. •
2540 W. MONROE ST., CHICAGO 12, ILL.

SEASONINGS

Oakite Composition No. 6
Gives You
7 Advantages
that increase
operating
efficiency
of your
CONVEYOR
CHAIN

Good News For
DAIRIES, BREWERIES,
CARBONATED BEVERAGE PLANTS!

Successfully used for over ten years by leading bottlers, this Oakite material AUTOMATICALLY keeps conveyor chain clean and SANITARY; provides right amount of "slip" and lubrication for bottles and chain; saves time and money in maintenance. Below are listed the 7 main advantages provided by

OAKITE COMPOSITION No. 6

1. Makes chain SELF-CLEANING
2. Does not build up black, gummy unsanitary deposits on conveyor surfaces
3. Provides ample "SLIP" for bottles
4. Extremely economical
5. Minimizes scratching, chipping and breakage of bottles because rubbing, twisting is practically eliminated
6. Extends life of chain
7. Supplies needed lubrication for chain

FREE BOOKLET Gives Full Details

How Oakite Composition No. 6 is applied and used is described in a concise booklet, free for the asking. Send for your copy today.

OAKITE PRODUCTS, INC., 26G Thames St., NEW YORK 6, N. Y.
Technical Service Representatives Conveniently Located in All Principal Cities of the United States and Canada

OAKITE *Specialized* CLEANING
MATERIALS · METHODS · SERVICE · FOR EVERY CLEANING REQUIREMENT

from his post as chief inspector of the Buffalo, N. Y., station, where his work chiefly concerned sanitary problems of the baking, milling, confectionery and related food fields.

Harold L. King has returned to his home in Flemington, N. J., from Bogota, Colombia, where he has been consulting with the Instituto do Fomento Industrial (Institute for the Promotion of Industry).

Col. William R. Maris has been appointed director of purchases for the Burry Biscuit Corp., Elizabeth, N. J. He recently retired from the Army after 34 years of service. In his new capacity, he will supervise buying activities of all Burry divisions and subsidiaries.

John W. Merrell has been named director of bakery service for Flour Mills of America, Inc., Kansas City, Mo. He previously was associated with Commander-Larabee Milling Co.

Theodore Riedeburg has joined Westvaco Chlorine Products Corp., New York, as technical service representative in charge of Westvaco insecticides and fumigants. In his new capacity Mr. Riedeburg will assist plant managers and sanitation engineers on problems concerning insect infestation. He has written many articles on food plant sanitation.

Lt. Col. Francis V. Rosseau has joined the research and development laboratories of General Foods Corp., Hoboken, N. J., where he will be in the engineering research section.

Don R. Wilson is now vice-president and director of sales and advertising for S. A. Moffett Co., Inc., Seattle. Mr. Wilson formerly was sales manager of the Lyndonville Canning Co., Inc., Lyndonville, N. Y.

Merle A. Yockey has been elected vice-president of the Pfeiffer Brewing Co., Detroit, Mich., succeeding Carleton E. Smith who has resigned. Mr. Smith will continue as a director of the company.

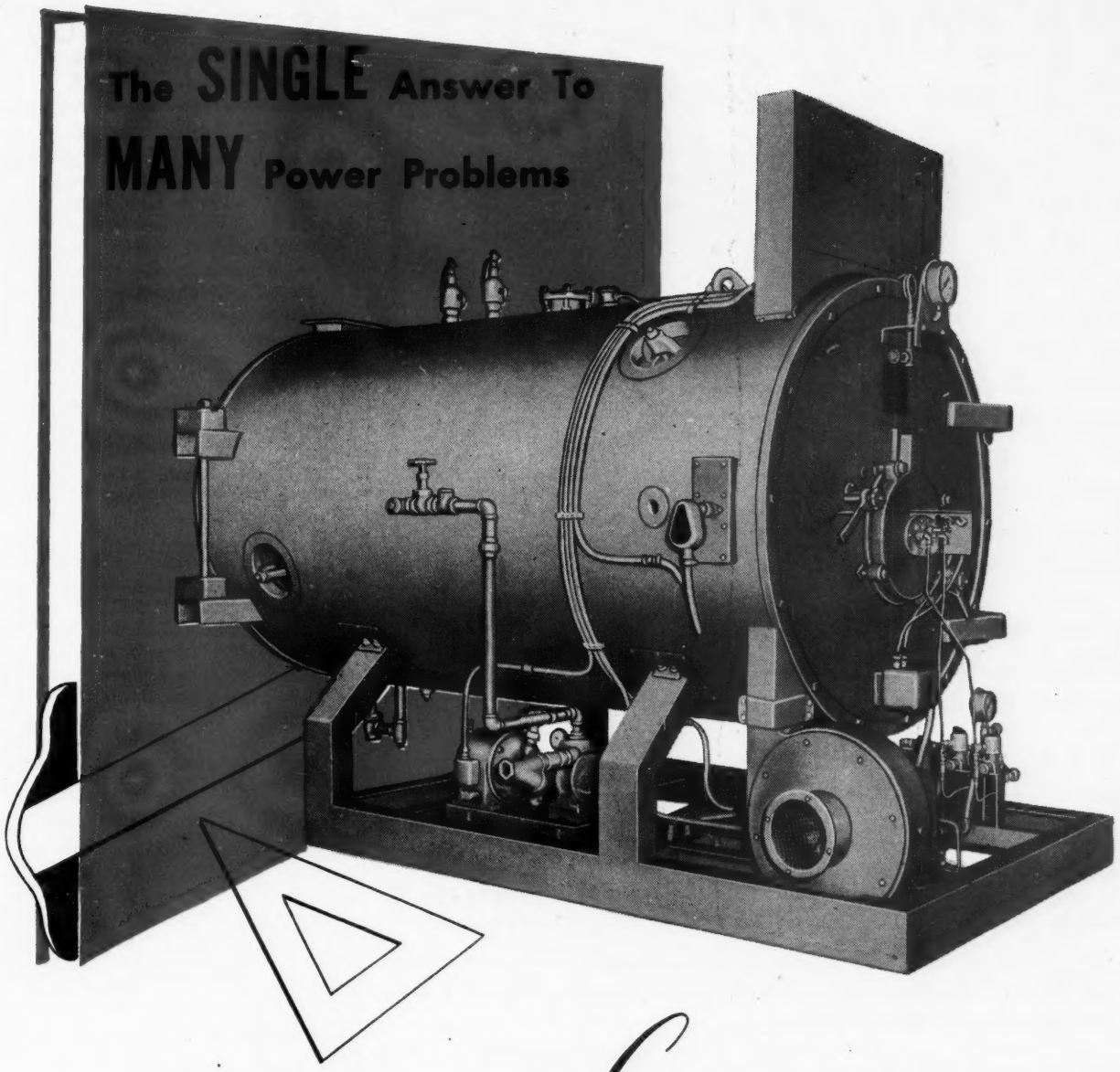
DEATHS

Percy R. Bachelle, 64, district manager for Hershey Chocolate Corp., Fort Wayne, Ind., December 20.

John L. Blish, 44, president of Blish Milling Co., Seymour, Ind., December 24.

George W. Dodd, 83, president of Hooton Chocolate Co., Newark, N. J., recently.

Louis Dashiell, 77, assistant treasurer of the National Canners Association, December 27, in Hyattsville, Md.



AMESTEAM *Generator*

Packaged Power is our business. And through it, we have helped lighten the load of many engineers. For the AMESTEAM Generator does so many things... offers so many obvious advantages!

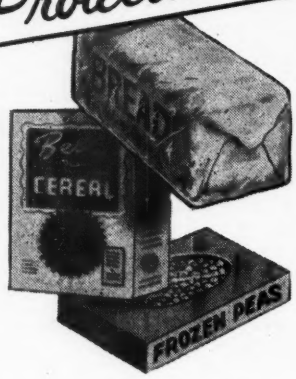
It takes up little space, yet it is completely self-contained—a package of low-cost power in units ranging from 10 to 300 horsepower. Its installation takes only minutes, yet it gives service year after year and requires very little manpower. And, it is so constructed that repairs (when necessary) take minimum time.

Designed and perfected with Ames' background of 100 years of engineering experience, the AMESTEAM Generator deserves the studied attention of every plant engineer with a steam service problem. Phone or write today for full information.

AMES IRON WORKS

BOX A2 OSWEGO, NEW YORK

WAX *Urgently Needed for* FOOD *Protection*



● When war conditions forced the United States to embargo the export of refined paraffin, the Canadian food industry became seriously handicapped by the resulting inadequate supplies of waxed wrapping papers.

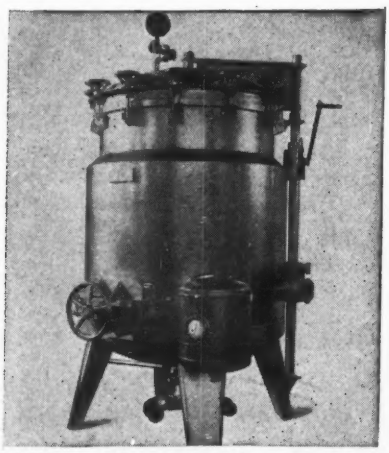
To meet this need, a Canadian manufacturer purchased a supply of crude scale paraffin . . . by-product of oil refining . . . for upgrading. He learned, however, that "sweating" the unrefined wax (which was fouled with petroleum residues) would necessitate a costly time-consuming installation of complicated equipment.

AN "N. F. E."* WAS CALLED IN. *The problem was solved!*

By means of *a completely jacketed Niagara Filter System,* the crude scale paraffin was decolorized and deodorized and all suspended material filtered!

Using this simple, economical engineered filtration procedure, "N. F. E."* refined the crude wax for impregnating food wrapping paper . . . *at about one-tenth the cost of the older method and in a fraction of the time!*

This "N. F. E."* treating-and-filtering process upgraded all the crude scale paraffin . . . produced a refined wax . . . a top-quality, top-price wax for treating paper for food wrapping!



ABOVE... A No. 200 typical steam-jacketed, all-stainless *Niagara Filter* with 15"x10" quick-opening cake removal door, vacuum receiver for cake washing, and discharge check valve.

THIS IS BUT ANOTHER EXAMPLE of Niagara's "Engineered Filtration"... of the filtration "know how" gained through years of training and experience in the successful filtration of numerous products over a long period of years!

IF IT CALLS FOR FILTRATION call for an "N. F. E."*... the complete engineering service from laboratory appraisal of the filtration characteristics of your product to producing the daily production requirements of your plant—at the lowest economical operating costs is available to you.

***"N. F. E."** — Niagara Filtration Engineer — a trained graduate engineer with years of actual field experience in chemical, food, fermentation and process industry filtration problems. Niagara Filter has a staff of N. F. E.'s available to assist you without cost or obligation.

niagara filter CORPORATION
3080 MAIN STREET BUFFALO 14, N. Y.
IN CANADA....NIAGARA FILTER CORPORATION (CANADA) LTD.
FILTRATION ENGINEERS TO THE PROCESSING INDUSTRIES

ASSOCIATED INDUSTRIES

Continental Can Co., Inc., has appointed Stewart A. Huge manager of production planning, succeeding L. H. Skougor, who is now technical assistant to the vice-president in charge of manufacturing. Other appointments recently made by the company include Walter F. Reinke, superintendent and assistant plant manager of Continental's Cameron, Ill., plant, and H. F. Campbell, general line district sales manager with headquarters in Atlanta, Ga. H. A. Eggerss, vice-president in charge of paper and plastics, has announced that all operations at the Chicago plastic plant have been discontinued and the equipment moved to Cambridge, Ohio.

Liquid Carbonic Corp., Chicago, through its president, P. F. Lavedan, announced an $8,500,000 expansion program that will include a $1,000,000 soda fountain factory and office building, and an $800,000 ice cream cabinet and refrigeration plant. A 50 percent production increase in its machinery division capacity for manufacturing bottlers and brewers' machinery also is contemplated.

Arthur D. Little, Inc., Cambridge, Mass., has initiated a program for research on ordnance storage for the Army. Dr. Charles S. Keevil, until recently a representative of the Flame Warfare Division of the National Defense Research Committee at Edgewood Arsenal, will head this work.

The Ohio Boxboard Co., Richmond, Ohio, has announced the appointment of Melvin E. Barthen as assistant to the vice-president in charge of production. William H. White has returned from the Armed Forces to assume duties as sales manager of the container division. While in the Army, Mr. White served as an officer in the packaging section of the Quartermaster Subsistence Research and Development Laboratory, Chicago.

Lt. A. C. Nydegger, USNR, has been relieved of active duty and resumed his position as manager of the Milwaukee office of Blackmer Pump Co.

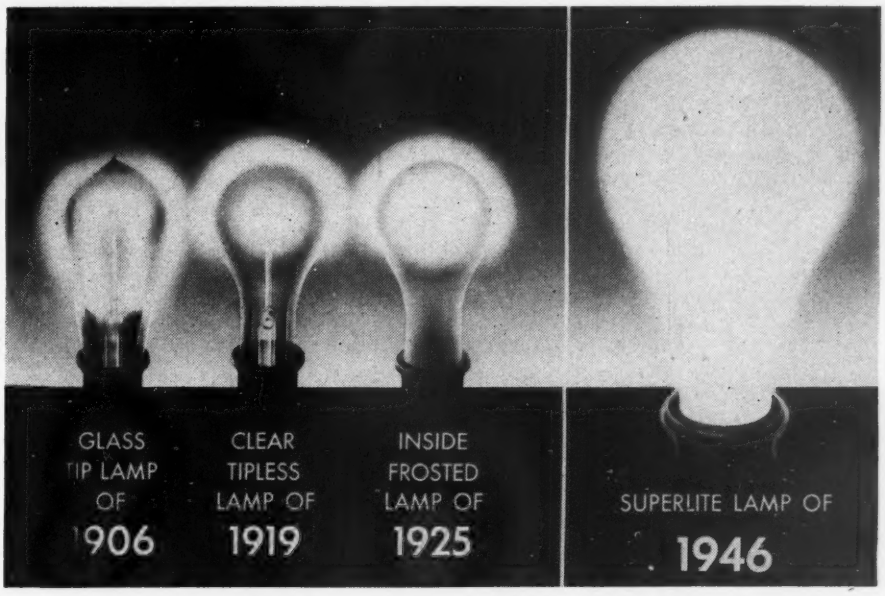
Sarco Co., Inc., New York, manufacturer of steam traps, temperature control and heating specialties, has announced the opening of a new office in Washington, D. C. Major H. F. Collins, formerly of the U. S. Army Engineers, will be in charge of the office.

Fred T. H. Youngman, formerly executive vice-president, has been elected president of the Jessop Steel Co., Washington, Pa. He succeeds R. Edson Emery, who is now chairman of the board.

FOOD EQUIPMENT NEWS

Light Bulb

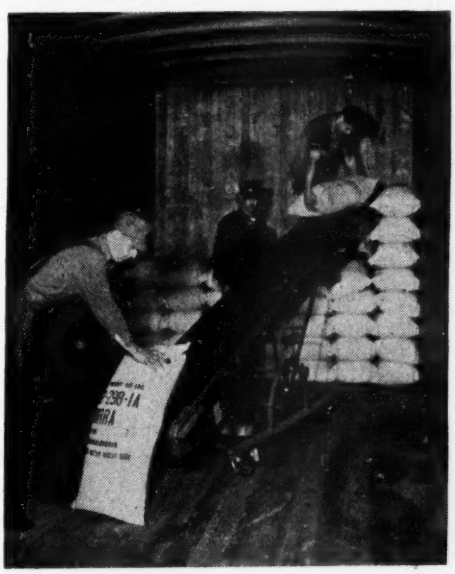
WABASH APPLIANCE CORPORATION, 335 Carroll St., Brooklyn, N. Y., announces a light bulb that glows evenly over its entire surface. The inside of the bulb is treated to diffuse the central glare point caused by the concentrated filament. This results in breaking up the light into millions of soft "counter diffusing" light rays that glow evenly over the entire bulb surface. This is said to be accomplished without sacrifice of visible illumination.



Light bulb evenly glowing over entire surface.

Portable Conveyor

AN all-purpose portable belt conveyor designed for carrying bags, boxes, crates, cartons and other types of packaged commodities has been put on the market by Standard Conveyor Co., North St. Paul 9, Minn. It is adjustable to any elevation and angle. The belt travels above its sidebed frame so that it can carry wide containers. It can handle 110-lb. bags or boxes, and will take a continuous load of 20 lb. per foot. One person can easily move the machine into any desired position.



Portable belt conveyor.

Oil Gages

SAID to combine unlimited visibility and unbreakable sights in a simple construction is a line of oil gages announced by Oil-Rite Corp., 3406 South 13th St., Milwaukee 7. An unbreakable plastic sight is supported by a heavy central stem and a top cap. The assembly is securely locked with an independent nut compressing the cork gasket, thus eliminating leakage. The use of a plastic sight instead of glass eliminates the protective shell usually used on glass gages and offers greater visibility.

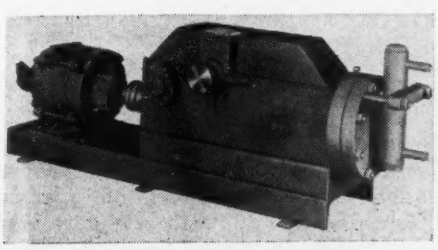
Standard sizes cover a gage range of 1¼ to 5 in. and a sight diameter of ½ to 1 in.

Proportioning Pump

A PROPORTIONING PUMP for heavy-duty solution feeding against pressures up to 5,000 p.s.i.—with a constant, manually adjustable rate of feed—is manufactured by Lapp Insulator Co., Inc., Le Roy, N. Y. It is a horizontal, direct-motor-driven, positive-displacement, reciprocating-diaphragm pump.

Corrosion-free materials are used in the reagent heads, which include an exclusive hydraulically-balanced diaphragm. This diaphragm is actuated by piston displacement through a hydraulic fluid, displacement being accurately measured by the piston in the cylinder. There is no mechanical connection with, or pressure differential against the diaphragm at any time. Packing glands are eliminated. The solution being handled is completely isolated from operating parts, and it is said that nothing can leak or corrode.

Five sizes are manufactured to provide a selection of capacities ranging from a few cubic centimeters to 10 gal. per hour.



Heavy-duty proportioning pump.

Continuous Heat Sealer

A CONTINUOUS heat sealer that will pick up bags from the filling machines and deliver them to the final packing position is announced by the Wrapade Machine Co., Inc., 1 Clinton St., Newark 2, N. J. Utilizing straight line heat and pressure closing, it will seal from 40 to 100 bags per minute. The tops of the bags can be folded over if desired.

The sealer is approximately 7 ft. long and is equipped with variable-speed drive to synchronize with any type of filling machine. It has safety devices for the protection of those working around it. All parts are easily available for cleaning, overhauling or replacement.

Labeler

VAC SPRAY MACHINE CO., 1700 Olson Blvd., Minneapolis, Minn., has developed a labeler that will apply labels from postage stamp size up to 5 in.

FERRY CONTINUOUS POTATO CHIP MACHINE

is completely automatic! Automatic from raw, unpeeled potatoes to finished product. Peeling, slicing, washing, drying, frying and salting . . . all are under perfect control. You can't beat a Ferry Potato Chip Machine.

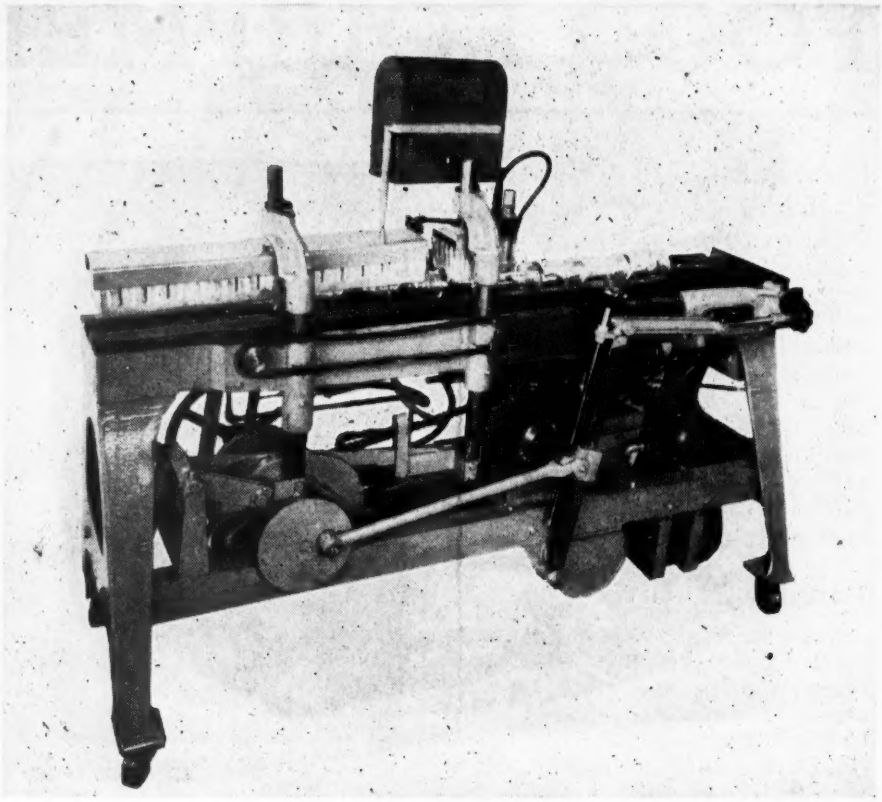
Also makers of

SLICERS AND AUTOMATIC SLICERS, FEEDERS AND CAN WASHING MACHINERY

J. D. FERRY CO.

129 SO. CAMERON ST.

HARRISBURG, PA.



Versatile labeling machine.

in diameter on containers from ¼ oz. to 1 gal. size, at rates from 1,200 to 3,000 per hour.

Changeover from one size or shape of label to another, or from one size container to another, is said to be accomplished in about one minute by simply turning a knob with no extra attachments required. Gummed or ungummed labels may be used. They may be foil, varnished, lithographed or plain.

Containers may be glass bottles, metal cans, cardboard boxes, and of any shape—round, square, triangle, or private mold.

The labeler is on casters and can be moved from one part of a plant to another, wherever an electric wall plug is available for power supply.

A feature is the magnetic label box which depends upon the force of gravity on lead weights and a built-in Alnico No. 5 magnet to hold the labels in place.

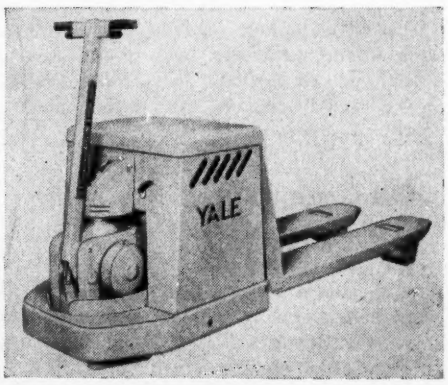
The machine weighs 1,250 lb., is 6 ft. long by 2 ft. wide and 4 ft. high.

Lift Truck

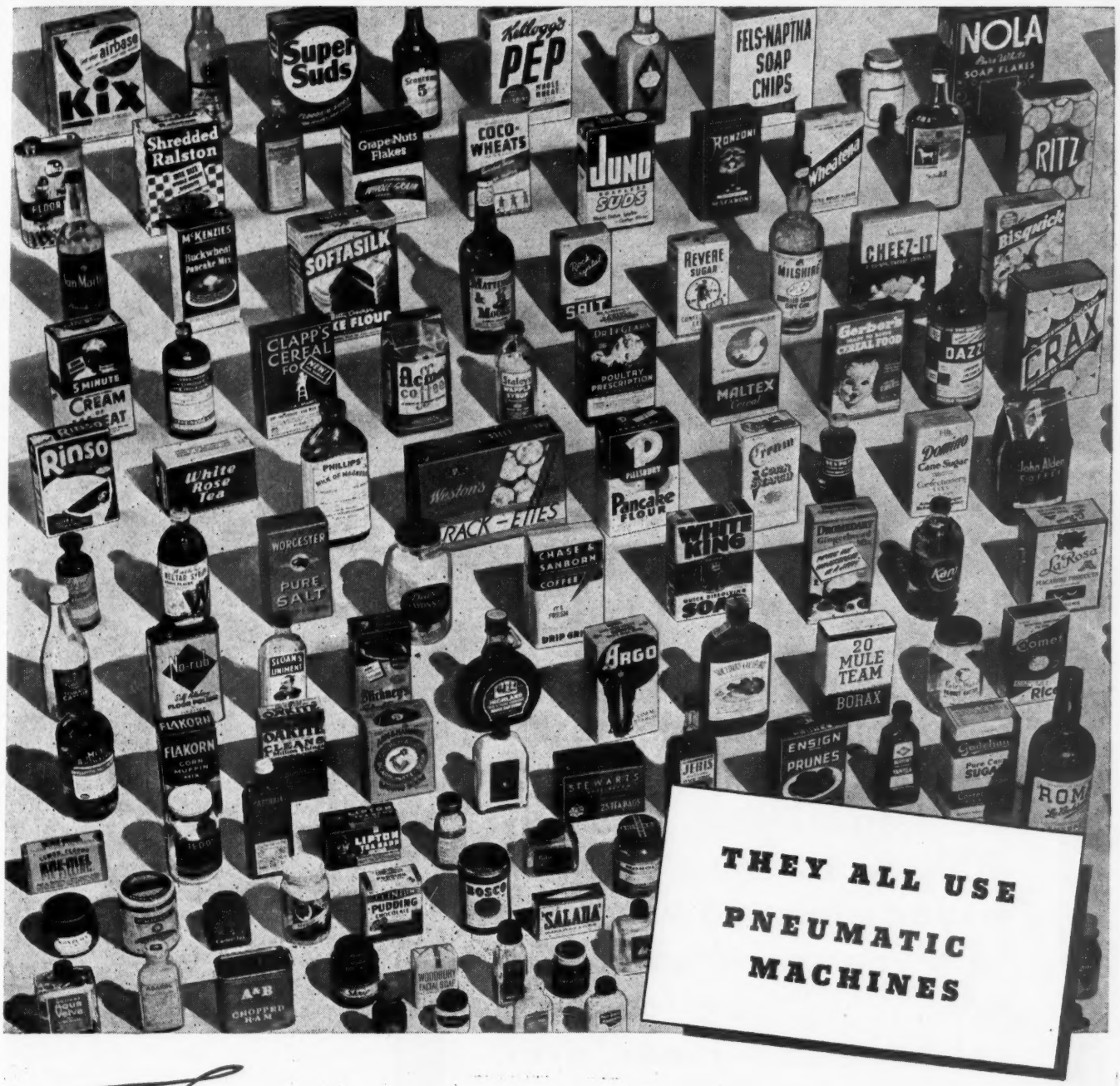
YALE & TOWNE MANUFACTURING CO., 4530 Tacony St., Philadelphia 24, Pa., has added an electric lift truck to its line. With power for lifting and power for travel, an operator can pick up and "walk off" with loads as heavy as 3 tons by using fingertip pressure on dual cam controls located immediately beneath the handbar-grip. These controls are so designed that when pressure is released they cut off the power. Two forward and two reverse speeds are provided. The unit is said to be compact and easily controlled. It can be maneuvered in congested areas, along narrow passages and around sharp corners without difficulty.

Lifting and lowering is controlled by a convenient switch, placed on the front of the battery compartment. The hydraulic ram operates in a honed cylinder, to provide long and efficient operation. The electric control and the valve mechanism are interlocked to eliminate overtravel of the lift.

When a load is deposited, a special type of hydraulic release cushions the descent, protecting load, floor and operators.



Electric lift truck.



THE EVIDENCE looks you in the eye from this impressive group of containers representing the best names in their respective fields. Pneumatic machines play a leading part in the packaging and bottling of these famed products, as they do in many others not shown here. They have been the universal choice of America's foremost manufacturers for more than fifty years and they are more widely employed and highly respected today than ever before. What better proof could you be given that Pneumatic machines produce better packages at a LOWER COST PER CONTAINER?

Follow the lead of these experienced users and consult Pneumatic first on your packaging and bottling equipment needs.

PNEUMATIC
PACKAGING AND BOTTLING
MACHINERY

PNEUMATIC SCALE CORPORATION, LTD.
★ 72 Newport Avenue, North Quincy 71, Mass. ★
New York San Francisco Chicago Los Angeles

DARNELL CASTERS

A SAVING AT EVERY TURN

Choose just the right caster or wheel for your needs from the Darnell line of nearly 4000 types. These precision made casters and wheels will help you speed up production . . . will pay for themselves many times over.

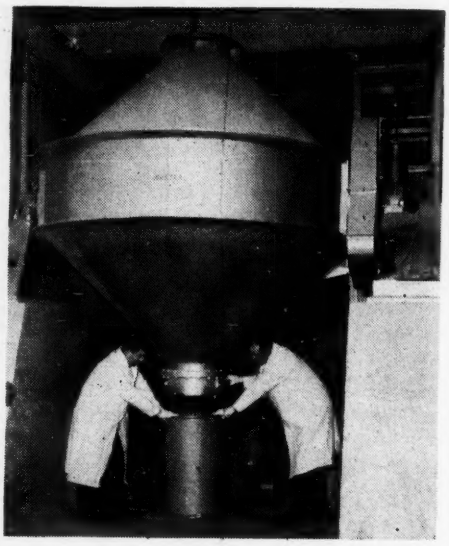
KEEP TURNING AND EARNING

DARNELL CORP. LTD. LONG BEACH 4, CALIFORNIA
60 WALKER ST. NEW YORK 13 N Y
36 N. CLINTON CHICAGO 6 ILL

& E-Z ROLL WHEELS

Conical Blender

AN unusually large double-cone blender (8 ft. in diameter) has been developed by H. K. Porter Co., Inc., Pittsburgh 22, Pa. It is constructed of stainless steel, has a dry blending



Double-cone blender.

capacity of 152 cu. ft., and will handle a load of 7,600 lb. The interior of the cone is ground to a smooth surface, eliminating the possibility of contaminating the mixture. It is well adapted to the mixing of various quantities, the tumbling action of the cone blender providing equality in the mixture of dry products such as flake and granular forms of gelatine.

Fire Extinguisher

A CARBON DIOXIDE hand fire extinguisher of unique design is announced by the B. F. Goodrich Co., Akron, Ohio. The container holds 4 lb. of carbon dioxide and comes with a carrying handle and control button designed for fast operation. It can be easily carried in one hand, with the thumb of the carrying hand operating the pushbutton.

A horn swivel raises or lowers as needed, remaining in lower position when attached to the wall rack furnished with each extinguisher, together with a quick release chain.

Painted vivid orange and black for high visibility, the extinguisher may be recharged at regular refill service establishments.

Load Lifter

RAISING finished goods from floor level to a loading platform and lowering raw materials from a freight-car to the floor are typical assignments for the Load Lifter built by Service Caster & Truck Division of

Their eyes have to reach...before their hands

Brighter, whiter Coated Lithwite Cartons give your product greater eye-and-buy appeal where it counts more than ever, today — at the point of sale

MORE ATTRACT-IVE PACKAGES. Packages that make shoppers' eyes *reach* for them. That's the point-of-sale advantage *Coated* Lithwite Cartons are giving many of America's leading products, today.

Coated Lithwite is the revolutionary paperboard that is formed, made and coated in one high-speed operation. Whiter. Brighter. Its smoother, harder, chalk-free surface makes a perfect base for printing inks... brings colors up brilliantly, reproduces halftones with sales-making realism.

Fewer "jammers" and "leakers." *Coated* Lithwite folds without flaking or shattering. Takes a tight, positive seal. Production of *Coated* Lithwite cartons is currently sold up. But get full facts about *Coated* Lithwite cartons now. Ask a Gardner-Richardson sales representative to call.

More eyes reach for your product in . . .

Coated Lithwite Cartons

THE GARDNER-RICHARDSON CO. • Manufacturers of Folding Cartons and Boxboard • Middletown, Ohio

Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT

RYERSON STEEL IN STOCK

Call Ryerson for any kind, shape or size of steel you need. Steel for manufacturing, maintenance or construction . . . all products are available for immediate shipment from any one of the ten convenient Ryerson Steel-Service Plants. Ask for a stock list . . . your guide to steel.

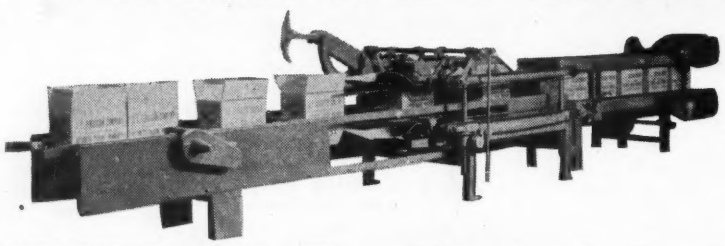
Principal Products Include:

Bars • Shapes • Structurals Plates • Sheets • Floor Plates • Alloy Steels • Tool Steels • Stainless Steel Screw Stock Wire • Mechanical Tubing • Reinforcing Steels • Shafting Babbitt • Nuts • Bolts Rivets • Welding Rod • Etc.

JOSEPH T. RYERSON & SON, INC.

STEEL-SERVICE PLANTS AT: CHICAGO, MILWAUKEE, ST. LOUIS, DETROIT, CLEVELAND, CINCINNATI, BUFFALO, BOSTON, PHILADELPHIA, JERSEY CITY

SEAL 50 TO 3000 CASES PER HOUR WITH PACKOMATIC'S MODEL D



PACKOMATIC Model "D" Case Sealers are applicable to practically any production requirement or plant layout. Compression units . . . geared for varying operating speeds (from 50 to 3,000 per hour) discharge cases completely sealed, squared—ready for shipping or storage.

PACKOMATIC'S *new* Model "D" is the result of 25 years of experience in perfecting packaging equipment for the nation's foremost producers. Its mechanism is simple . . . trouble-free . . . maintenance cost is low . . . An adhesive-saver, time-saver, space-saver.

Learn more about other PACKOMATIC filling, sealing and weighing equipment designed to speed your products to market.

Consult Classified Telephone Directory — or write Joliet.

PACKOMATIC

PACKAGING MACHINERY

J. L. FERGUSON CO. JOLIET, ILL

New York • Chicago • Boston • Cleveland • Denver
Los Angeles • San Francisco • Seattle
Baltimore • Philadelphia

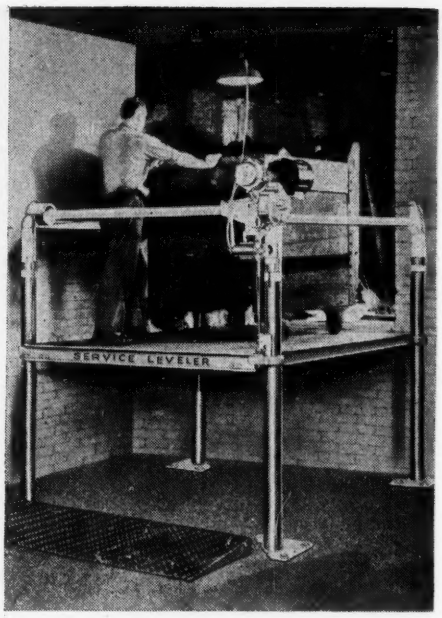
J. L. Ferguson Co., Joliet, Illinois

Please send complete data on ☐ Case Sealing ☐ Carton Filling and Sealing ☐ Package Weighing Equipment.

Company .....

Address .....

City..... State.....



Load lifter.

Domestic Industries, Inc., Albion, Mich., announce a load lifter. It can be installed either indoors or outdoors. It is shipped knocked down, and the average installation is said to take only a few hours.

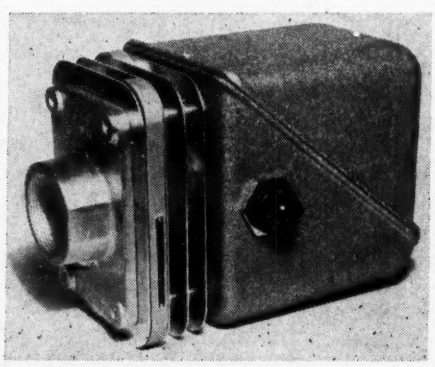
The fully inclosed power unit and motor are positive under all operating conditions. A free-wheel brake controls the lowering of the platform at a steady predetermined speed. A centrifugal governor operates an emergency safety brake.

Control of the platform travel is governed by an automatic traveling nut and flat-cam mechanism that automatically stops the motor at top height and floor level. Stops at intermediate heights are made by operating the switch.

Flame-Failure Safeguard

"FIREYE" is the name of a flame-failure safeguard designed to provide explosion protection for all industrial and commercial oil and pulverized coal burners. It is manufactured by Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.

It is not a thermal control, but is



Flame-failure safeguard.

How to "Take the Heat Off" your motor maintenance problems

Excessive time and dollar losses are being avoided in every industry—by *specifying* Fiberglas* *High Safety Factor* Electrical Insulation in new motors and for rewinds.

When scores of plants were operating at full-time war production, Fiberglas Insulation Materials provided "extra" protection to overcome conditions which caused most motor burnouts and failures—heat, moisture, corrosive vapors or acids, overload and the human element. One company was operating twenty-five variable speed motors which were subjected to heavy overloads under conditions of high ambient heat, high humidity. The average life of these motors, ranging from 2½ to 10 hp. had been about four weeks. Fiberglas-Base Insulation Materials were specified—the service life of these motors was lengthened many times—and "the heat was off" the motor maintenance problem in this plant.

Why not try the remedy that has been so successful for other concerns? Get complete information about Fiberglas Electrical Insulation Materials. Write for your copy of the new catalog and ask for the names of the distributors serving your locality. *Owens-Corning Fiberglas Corporation, 2009 Nicholas Building, Toledo 1, Ohio. In Canada, Fiberglas Canada Ltd., Oshawa, Ont.*

ASK FOR FIBERGLAS—IN YOUR NEXT MOTOR—AND ON YOUR NEXT REWIND.

ELECTRICAL INSULATION MATERIALS

FIBERGLAS

*T. M. Reg. U. S. Pat. Off

Other Fiberglas Products: Thermal and Acoustical Insulations • Dust-Stop* Air Filters • Yarns, Cloths, Mats and Basic Fibers

VODOL

Corn Oil Lecithin

STABILIZER • ANTIOXIDANT • EMULSIFIER *(as agent)*

Natural Phosphatide extract of corn oil, perfected by our process

Qualities of VODOL

Conclusively demonstrated by leading users in

PACKING INDUSTRIES
BAKING
CONFECTIONS
MARGARINE
DRUGS & COSMETICS

Use Coupon below for liberal FREE Samples of VODOL. Try it! Let your own tests decide.

Refining Unincorporated
407 S. Dearborn St., Chicago 5, Ill.

Send us samples of VODOL.

Name_____

Position with Firm_____

Firm Name_____

Address_____

_____

Remarks_____

_____

VODOL has rapidly gained a position of high preference among users of lecithins, from the largest to the smallest processors and producers. Reasons for this choice of VODOL are found in RESULTS THESE USERS HAVE ARRIVED AT, IN THEIR OWN TESTS AND COMPARISONS. The following qualities of VODOL are convincingly attested:

VODOL is absolutely neutral as to *Odor* and *Taste* in end use

This is the unanimous finding in hundreds of comparative proof tests. As an outstanding characteristic, it establishes VODOL as a prime essential for products of the most exacting standards.

Instantly soluble at low temperatures. VODOL does not require pre-heating, pre-dissolving, straining nor thinning.

VODOL pours freely. Is easily handled. Disperses in liquid, solid, or semi-solid fats. When used in margarine, VODOL does not darken under normal frying temperatures.

VODOL IS AVAILABLE FOR IMMEDIATE SHIPMENT IN DRUMS OF 500 LBS., 50 LBS., AND 25 LBS. ★★★ SMALLER PACKAGES BY ARRANGEMENT.

Exclusive Product of

REFINING UNINCORPORATED
407 S. Dearborn St., Chicago 5, Illinois

FROM REPORT OF A LEADING LABORATORY

Straight dough bread made up to contain 4% shortening with **VODOL** added to replace 1.5% of shortening.

Addition of **VODOL** gave softer loaf when fresh, and softer loaf **42 HOURS AFTER** baking. Softness as revealed by test is expressed in Millimeters and represents compressibility of a slice under load in 10 seconds. The softer the bread, the greater the compressibility. Results:

Test for Freshness

Oven No.	1	2	3	Av.
Fresh: No VODOL	93	90	89	91
FRESH: VODOL	100	104	93	102
42-hr. old bread: No VODOL	26	26	33	28
42-hr. old bread: VODOL	42	47	48	45

MEN • JOBS • COMPANIES

INDUSTRY

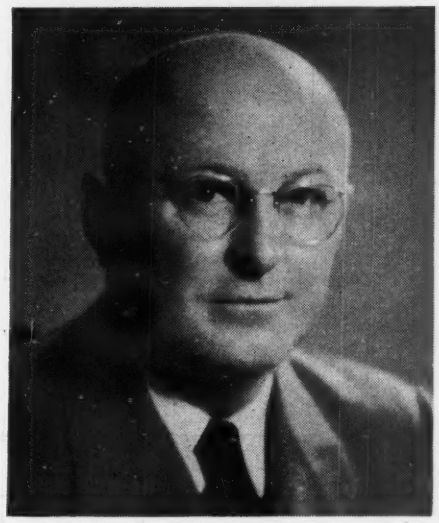
B. & B. Ice Cream Co., Inc., Norwood, Ohio, plans to build a new one-story plant in Cincinnati. The structure will contain general offices, an ice cream processing department and a retail sales unit.

The Borden Co., through its president, Theodore G. Montague, has announced its intention to spend approximately $23,000,000 in 1946 for extension and improvement.

Butler Packing Co., Seattle, Wash., plans immediate construction of a $1,000,000 packing plant in Oakland, Calif. The company has announced that it will add several tomato specialties to its line, at the Oakland plant.

California Packing Corp., San Francisco, has announced plans to establish a packing plant in Findlay, Ohio, for the purpose of canning tomatoes, corn, lima beans and peas. According to L. S. Argall, manager of the company's midwest division, cost of the project will be from $1,000,000 to $1,500,000.

Chef Boy-Ar-Dee Quality Foods, Inc., Milton, Pa., is planning a broad expansion program to include a new laboratory, flour elevator and equipment. The laboratory will extend its services to the farmers of the region, who will be able to obtain soil analyses, acidity and fertilization tests, as well as benefits from experiments on vegetable disease control. Announcement was made by Carl A. Colombi, executive vice-president of the firm.



W. L. KRUPPENBACHER

Formerly executive vice-president of Mars, Inc., Chicago, W. L. Kruppenbacher has been elected president and chairman of the board, succeeding the late Ethel V. Mars.

Gangi Bros., Santa Clara, Calif., has awarded a contract for construction of a new $100,000 tomato cannery. The plant is expected to be in operation this year.

Hiram Walker & Sons, Inc., Walerville, Ont., has announced that it will enlarge its distillery by expanding more than $2,500,000 for new buildings and equipment.

Mason, Au and Magenheimer, confectionery manufacturing company, Brooklyn, N. Y., has purchased 33 acres in Mineola, N. Y., on which it plans to erect a new factory.

Maxson Food Systems, a division of The W. L. Maxson Corp. of New York, has announced its forthcoming entrance into the frozen seafood field. The company plans to operate a plant on the New England coast where it will precook and quick-freeze swordfish cakes, saute scallops, soft shell crabs, clam chowder, fried oysters and clams and other seafood items.

Megowen-Educator Food Co., through its president, R. L. Megowen, has announced the purchase of property in Lowell, Mass., which will be used in connection with the expansion program of the company.

Pacific Can Co. will construct a $1,000,000 combination cannery and can manufacturing plant at San Leandro, Calif. The cannery, scheduled for completion by June 1, will be operated by the Oakland Canning Co. According to E. F. Euphrat, president of Pacific Can Co., the joint production schedule of the plant is expected to be 2,500,000 cases of fruits and vegetables annually and 2,000,000 cans daily.

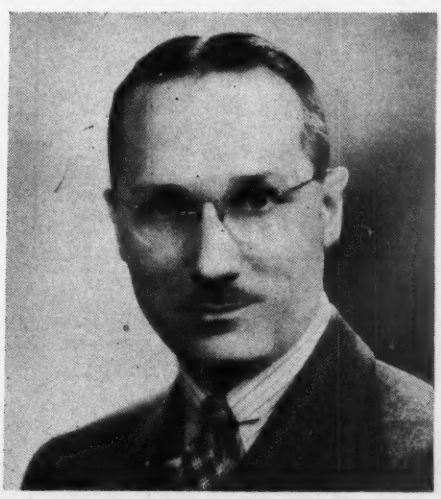
Paragon Fishing Co. has added to its line of canneries and fishery installations in Washington and Oregon by opening a plant in Portland for the manufacture of fish cakes.

Portales Valley Mills, Portales, N. Mex., peanut oil processing plant, recently lost by fire its mill, processing machinery and 15 carloads of raw peanuts.

Red Top Brewing Co., Cincinnati, Ohio, has purchased the Clyffside

ROY K. DURHAM

Millers' National Federation, Chicago, has appointed Roy K. Durham director of its technical service. Mr. Durham has been production superintendent of Rodney Milling Co., Kansas City, for many years.

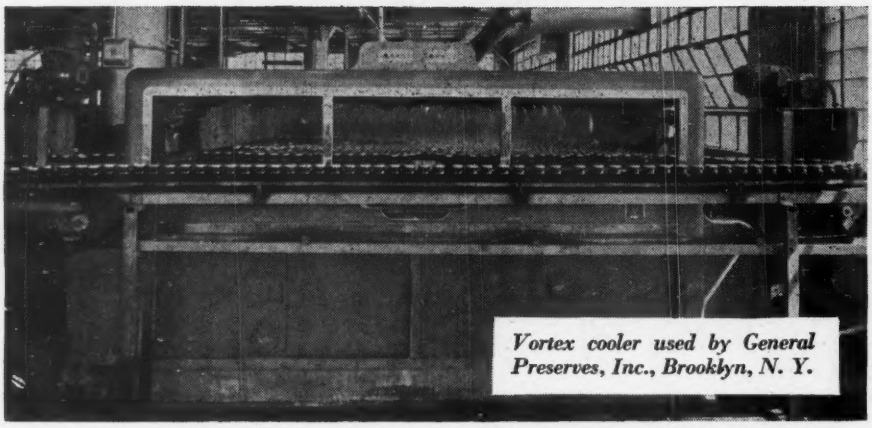


DR. DARRELL ALTHAUSEN

Fritzsche Brothers, Inc., New York, manufacturer of essential oils, has appointed Dr. Darrell Althausen as head of the company's new products department. He will be located at the Clifton, N. J., laboratories.

WILLARD ELIEL

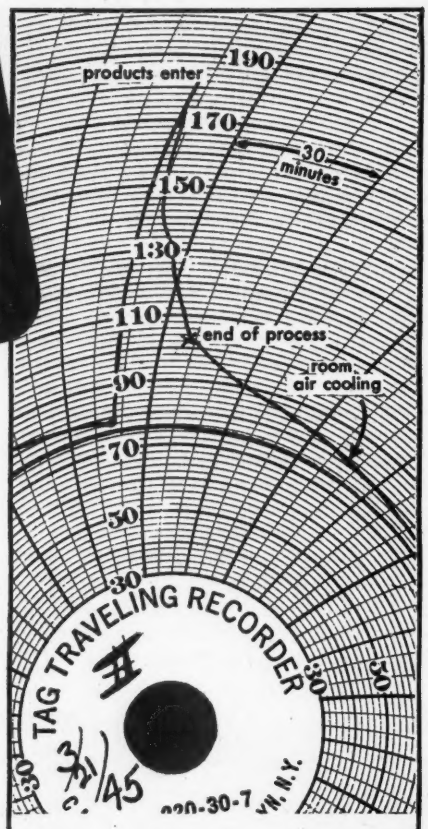
Identified with production activities of College Inn Food Products Co., Chicago, for 23 years, Willard Eliel recently has been made executive vice-president of the company, succeeding Dwight Mahan.



Vortex cooler used by General Preserves, Inc., Brooklyn, N. Y.

Your Hot Packaged Foods Deserve

VORTEX Automatic Cooling



The process recorded above is cooling 1 lb. hot marmalade jars 80° F. within 20 minutes to packing temperature.

Automatic cooling of your products deserves scientific treatment to preserve the original flavors and clarity by *positive* control of time and temperature.

The Vortex system is entirely automatic in operation and can be run continuously without operators, requiring only routine maintenance. The heat exchange medium is atomized water, distributed over the containers in such a manner that maximum cooling is achieved with a minimum quantity of water.

Vortex coolers are widely adaptable to individual requirements and have an almost limitless capacity range for all sizes of jars, bottles or cans. The use of these machines greatly conserves floor space and allows for immediate labeling and packing. A rapid drying system can be supplied with the discharge conveyors, if desired.

Whatever your problem of cooling—or heating—your products, it will pay you to learn the Vortex method of achieving uniform results economically. Send us your process requirements and write for bulletin No. 87 today.

BARRY-WEHMILLER MACHINERY CO.

1946 . . . Our 61st Anniversary St. Louis, Mo., U.S.A.

Brewing Co. of the same city. The acquisition includes stocks, physical properties, brand names and trade marks. Louis Ullman is president of Red Top.

PERSONNEL

H. E. Apple, Jr., Rochester, N. Y., has been elected president of the Association of New York State Canners. Other officers elected are: E. E. Burns, vice-president and H. J. Torrey, treasurer.

Maj. Howard G. Boerner has been appointed to supervise the marketing of a new line of specialty food products for Florida Foods, Inc., Boston. Prior to his entry into the armed forces, Major Boerner was division sales manager of the Birdseye-Snyder Division of General Foods Corp.

Lt. Robert Couch, formerly with the Packaging Branch of the Quartermaster Subsistence Research and Development Laboratory, Chicago, has joined the packaging division of General Foods Corp., New York.

William P. Fay, former sales promotion manager of General Food Sales Co., institution products, has been appointed vice-president in charge of sales, merchandising and promotion for the midwestern territory of Snow Crop Frozen Foods. He will make his headquarters in Chicago.

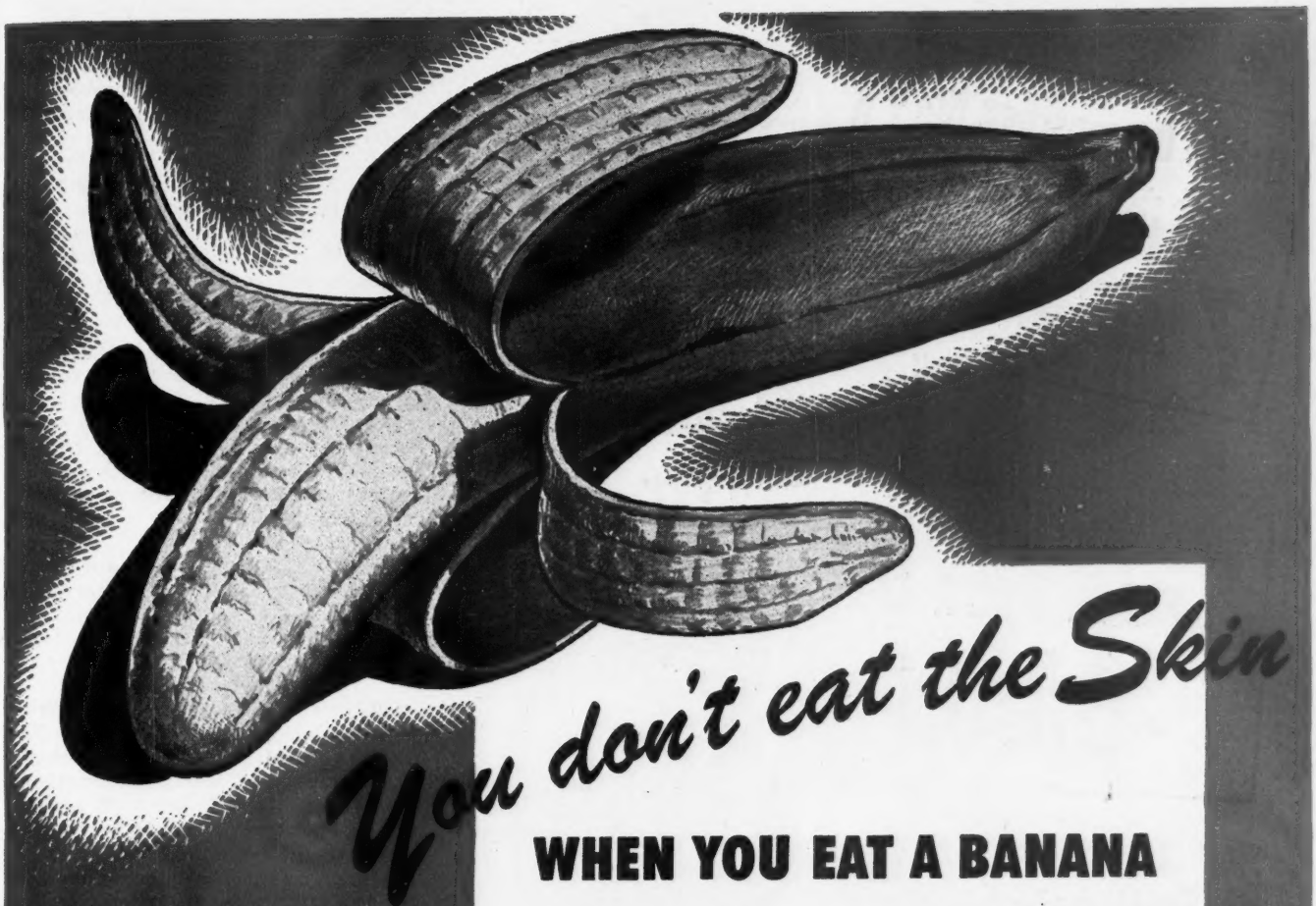
Martin J. Gerrits, who has been sales director of Valier and Spies Milling Co., St. Louis, Mo., is now manager of the bakery department of the H. A. Smith Stores, Port Huron, Mich.

Maj. G. V. Hallman, Quartermaster Corps, formerly in the research department of Continental Can Co., Chicago, has been transferred from Sidney, Australia, to Berlin, Germany, where he is in the Control Commission (American Zone).

Dr. Frederick W. Hayward, associated with the New York State Experimental Station at Geneva, N. Y., for the past nine years, has joined the staff of the Industrial Research Institute of the University of Chattanooga, where he will specialize in research on foods.

Col. David Henry, formerly Commandant of the Subsistence School of the Chicago Quartermaster Depot, Chicago, is now with the dairy and poultry section of Armour and Co., Chicago.

Dr. Edward L. Holmes has been appointed to head up the sanitation program of the American Institute of Baking, Chicago. For the past ten years, Dr. Holmes has been associated with the Food and Drug Administration, and joins the Institute directly



You don't eat the Skin

WHEN YOU EAT A BANANA

And for the same reason there isn't any point in loading your products with a lot of hulls, sticks, impurities and waste material, when it's the true spice flavor you want.

At Stange we call this waste material "exhausted" pepper, cloves, or cinnamon, as the case may be. We throw tons of it away every year because it has no flavoring value in your food products.

We start with spices in their natural form—yes—but in our exclusive process of extraction, we get ALL the flavor in a concentrated, easy to use form. All foreign matter is disposed of, leaving in Cream of Spice seasonings *only* the true, full spice flavor that *always* has the *same degree of strength.*

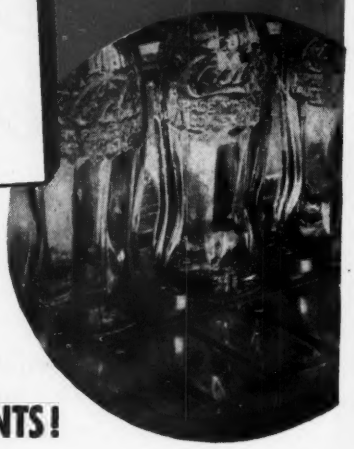
To get TRUE flavor—ask for Stange's C.O.S. (Cream of Spice) Seasonings.

Stange's
CREAM OF SPICE

• WM. J. STANGE CO. •
2540 W. MONROE ST., CHICAGO 12, ILL.

SEASONINGS

Oakite Composition No. 6
Gives You
7 Advantages
that increase
operating
efficiency
of your
CONVEYOR
CHAIN



Good News For
DAIRIES, BREWERIES,
CARBONATED BEVERAGE PLANTS!

Successfully used for over ten years by leading bottlers, this Oakite material AUTOMATICALLY keeps conveyor chain clean and SANITARY; provides right amount of "slip" and lubrication for bottles and chain; saves time and money in maintenance. Below are listed the 7 main advantages provided by

OAKITE COMPOSITION No. 6

1. Makes chain SELF-CLEANING
2. Does not build up black, gummy unsanitary deposits on conveyor surfaces
3. Provides ample "SLIP" for bottles
4. Extremely economical
5. Minimizes scratching, chipping and breakage of bottles because rubbing, twisting is practically eliminated
6. Extends life of chain
7. Supplies needed lubrication for chain

FREE BOOKLET Gives Full Details

How Oakite Composition No. 6 is applied and used is described in a concise booklet, free for the asking. Send for your copy today.

OAKITE PRODUCTS, INC., 26G Thames St., NEW YORK 6, N. Y.
Technical Service Representatives Conveniently Located in All Principal Cities of the United States and Canada

OAKITE *Specialized* CLEANING
MATERIALS · METHODS · SERVICE · FOR EVERY CLEANING REQUIREMENT

from his post as chief inspector of the Buffalo, N. Y., station, where his work chiefly concerned sanitary problems of the baking, milling, confectionery and related food fields.

Harold L. King has returned to his home in Flemington, N. J., from Bogota, Colombia, where he has been consulting with the Instituto do Fomento Industrial (Institute for the Promotion of Industry).

Col. William R. Maris has been appointed director of purchases for the Burry Biscuit Corp., Elizabeth, N. J. He recently retired from the Army after 34 years of service. In his new capacity, he will supervise buying activities of all Burry divisions and subsidiaries.

John W. Merrell has been named director of bakery service for Flour Mills of America, Inc., Kansas City, Mo. He previously was associated with Commander-Larabee Milling Co.

Theodore Riedeburg has joined Westvaco Chlorine Products Corp., New York, as technical service representative in charge of Westvaco insecticides and fumigants. In his new capacity Mr. Riedeburg will assist plant managers and sanitation engineers on problems concerning insect infestation. He has written many articles on food plant sanitation.

Lt. Col. Francis V. Rosseau has joined the research and development laboratories of General Foods Corp., Hoboken, N. J., where he will be in the engineering research section.

Don R. Wilson is now vice-president and director of sales and advertising for S. A. Moffett Co., Inc., Seattle. Mr. Wilson formerly was sales manager of the Lyndonville Canning Co., Inc., Lyndonville, N. Y.

Merle A. Yockey has been elected vice-president of the Pfeiffer Brewing Co., Detroit, Mich., succeeding Carleton E. Smith who has resigned. Mr. Smith will continue as a director of the company.

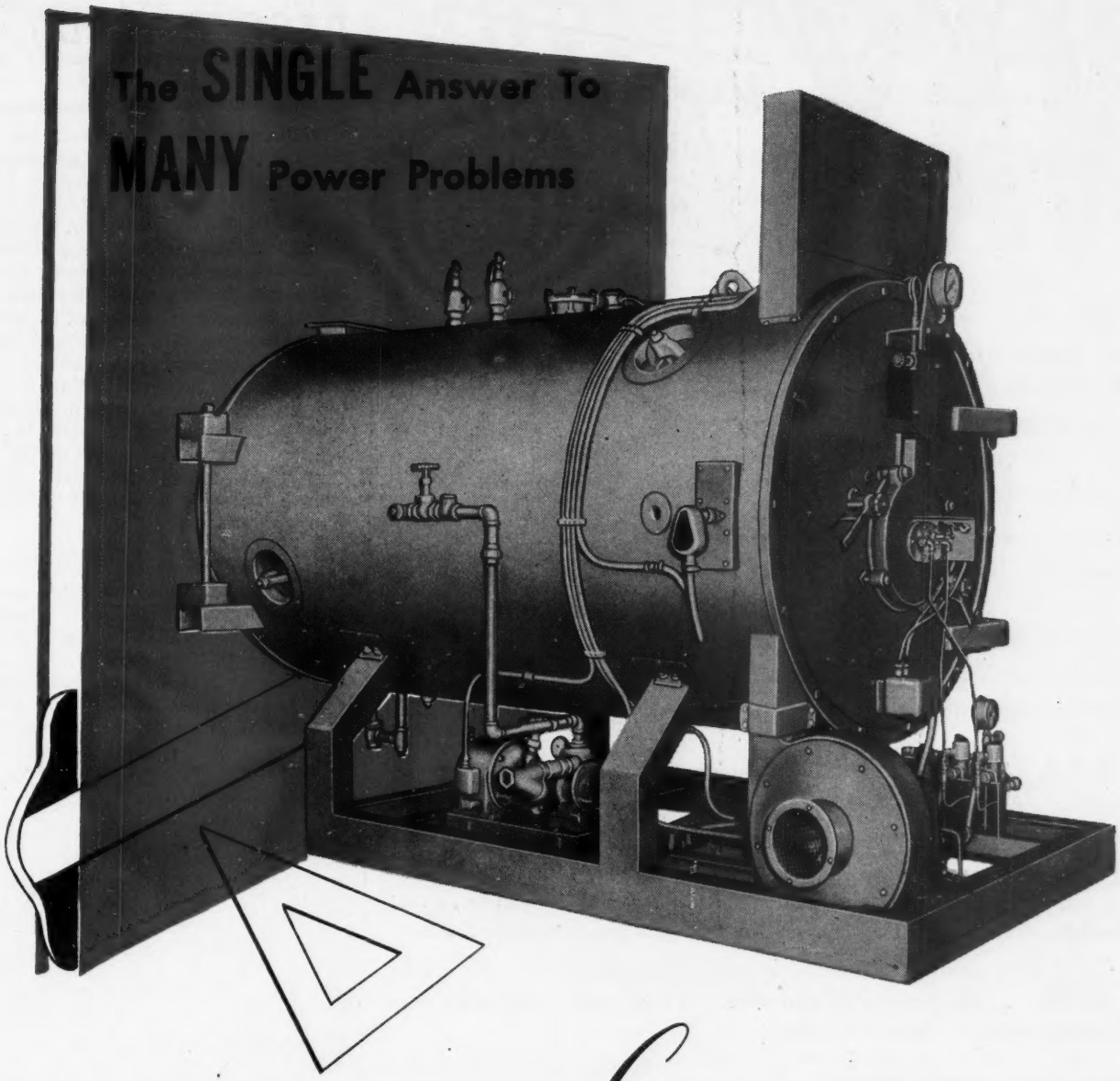
DEATHS

Percy R. Bachelle, 64, district manager for Hershey Chocolate Corp., Fort Wayne, Ind., December 20.

John L. Blish, 44, president of Blish Milling Co., Seymour, Ind., December 24.

George W. Dodd, 83, president of Hooton Chocolate Co., Newark, N. J., recently.

Louis Dashiell, 77, assistant treasurer of the National Canners Association, December 27, in Hyattsville, Md.



AMESTEAM *Generator*

Packaged Power is our business. And through it, we have helped lighten the load of many engineers. For the AMESTEAM Generator does so many things... offers so many obvious advantages!

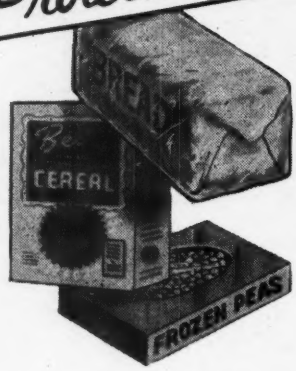
It takes up little space, yet it is completely self-contained—a package of low-cost power in units ranging from 10 to 300 horsepower. Its installation takes only minutes, yet it gives service year after year and requires very little manpower. And, it is so constructed that repairs (when necessary) take minimum time.

Designed and perfected with Ames' background of 100 years of engineering experience, the AMESTEAM Generator deserves the studied attention of every plant engineer with a steam service problem. Phone or write today for full information.

AMES IRON WORKS

BOX A2 OSWEGO, NEW YORK

WAX *Urgently Needed for* FOOD *Protection*



● When war conditions forced the United States to embargo the export of refined paraffin, the Canadian food industry became seriously handicapped by the resulting inadequate supplies of waxed wrapping papers.

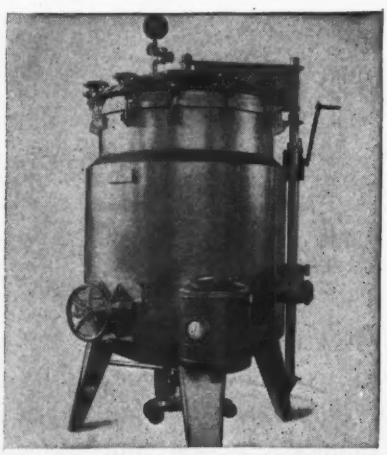
To meet this need, a Canadian manufacturer purchased a supply of crude scale paraffin . . . by-product of oil refining . . . for upgrading. He learned, however, that "sweating" the unrefined wax (which was fouled with petroleum residues) would necessitate a costly time-consuming installation of complicated equipment.

AN "N. F. E."* WAS CALLED IN. *The problem was solved!*

By means of *a completely jacketed Niagara Filter System,* the crude scale paraffin was decolorized and deodorized and all suspended material filtered!

Using this simple, economical engineered filtration procedure, "N. F. E."* refined the crude wax for impregnating food wrapping paper . . . *at about one-tenth the cost of the older method and in a fraction of the time!*

This "N. F. E."* treating-and-filtering process upgraded all the crude scale paraffin . . . produced a refined wax . . . a top-quality, top-price wax for treating paper for food wrapping!



ABOVE... A No. 200 typical steam-jacketed, all-stainless *Niagara Filter* with 15"x10" quick-opening cake removal door, vacuum receiver for cake washing, and discharge check valve.

THIS IS BUT ANOTHER EXAMPLE of Niagara's "Engineered Filtration"... of the filtration "know how" gained through years of training and experience in the successful filtration of numerous products over a long period of years!

IF IT CALLS FOR FILTRATION call for an "N. F. E."*... the complete engineering service from laboratory appraisal of the filtration characteristics of your product to producing the daily production requirements of your plant—at the lowest economical operating costs is available to you.

*"**N. F. E.**" — Niagara Filtration Engineer — a trained graduate engineer with years of actual field experience in chemical, food, fermentation and process industry filtration problems. Niagara Filter has a staff of N. F. E.'s available to assist you without cost or obligation.

niagara filter CORPORATION
3080 MAIN STREET BUFFALO 14, N. Y.
IN CANADA....NIAGARA FILTER CORPORATION (CANADA) LTD.
FILTRATION ENGINEERS TO THE PROCESSING INDUSTRIES

ASSOCIATED INDUSTRIES

Continental Can Co., Inc., has appointed Stewart A. Huge manager of production planning, succeeding L. H. Skougor, who is now technical assistant to the vice-president in charge of manufacturing. Other appointments recently made by the company include Walter F. Reinke, superintendent and assistant plant manager of Continental's Cameron, Ill., plant, and H. F. Campbell, general line district sales manager with headquarters in Atlanta, Ga. H. A. Eggerss, vice-president in charge of paper and plastics, has announced that all operations at the Chicago plastic plant have been discontinued and the equipment moved to Cambridge, Ohio.

Liquid Carbonic Corp., Chicago, through its president, P. F. Lavedan, announced an $8,500,000 expansion program that will include a $1,000,000 soda fountain factory and office building, and an $800,000 ice cream cabinet and refrigeration plant. A 50 percent production increase in its machinery division capacity for manufacturing bottlers and brewers' machinery also is contemplated.

Arthur D. Little, Inc., Cambridge, Mass., has initiated a program for research on ordnance storage for the Army. Dr. Charles S. Keevil, until recently a representative of the Flame Warfare Division of the National Defense Research Committee at Edgewood Arsenal, will head this work.

The Ohio Boxboard Co., Richmond, Ohio, has announced the appointment of Melvin E. Barthen as assistant to the vice-president in charge of production. William H. White has returned from the Armed Forces to assume duties as sales manager of the container division. While in the Army, Mr. White served as an officer in the packaging section of the Quartermaster Subsistence Research and Development Laboratory, Chicago.

Lt. A. C. Nydegger, USNR, has been relieved of active duty and resumed his position as manager of the Milwaukee office of Blackmer Pump Co.

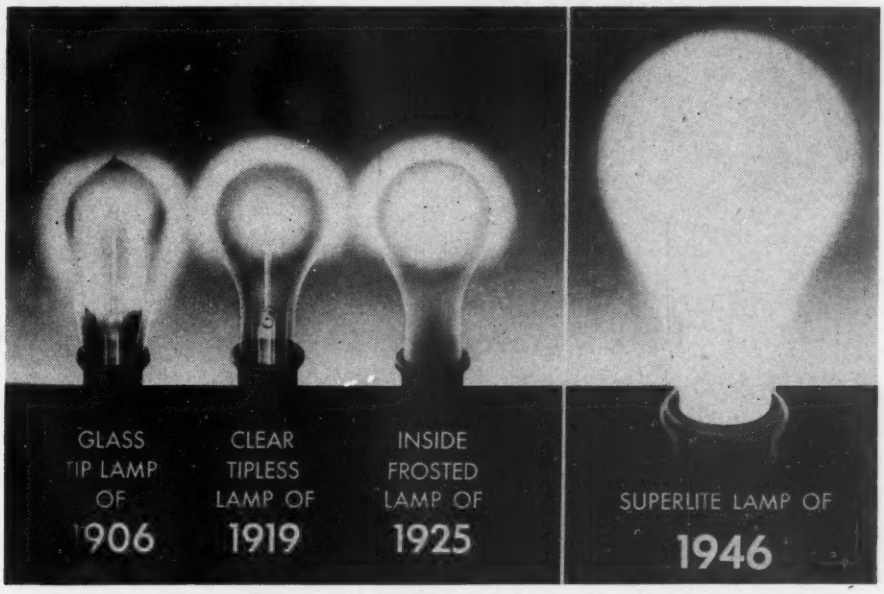
Sarco Co., Inc., New York, manufacturer of steam traps, temperature control and heating specialties, has announced the opening of a new office in Washington, D. C. Major H. F. Collins, formerly of the U. S. Army Engineers, will be in charge of the office.

Fred T. H. Youngman, formerly executive vice-president, has been elected president of the Jessop Steel Co., Washington, Pa. He succeeds R. Edson Emery, who is now chairman of the board.

FOOD EQUIPMENT NEWS

Light Bulb

WABASH APPLIANCE CORPORATION, 335 Carroll St., Brooklyn, N. Y., announces a light bulb that glows evenly over its entire surface. The inside of the bulb is treated to diffuse the central glare point caused by the concentrated filament. This results in breaking up the light into millions of soft "counter diffusing" light rays that glow evenly over the entire bulb surface. This is said to be accomplished without sacrifice of visible illumination.



Light bulb evenly glowing over entire surface.

Portable Conveyor

AN all-purpose portable belt conveyor designed for carrying bags, boxes, crates, cartons and other types of packaged commodities has been put on the market by Standard Conveyor Co., North St. Paul 9, Minn. It is adjustable to any elevation and angle. The belt travels above its sidebed frame so that it can carry wide containers. It can handle 110-lb. bags or boxes, and will take a continuous load of 20 lb. per foot. One person can easily move the machine into any desired position.

Portable belt conveyor.

Oil Gages

SAID to combine unlimited visibility and unbreakable sights in a simple construction is a line of oil gages announced by Oil-Rite Corp., 3406 South 13th St., Milwaukee 7. An unbreakable plastic sight is supported by a heavy central stem and a top cap. The assembly is securely locked with an independent nut compressing the cork gasket, thus eliminating leakage. The use of a plastic sight instead of glass eliminates the protective shell usually used on glass gages and offers greater visibility.

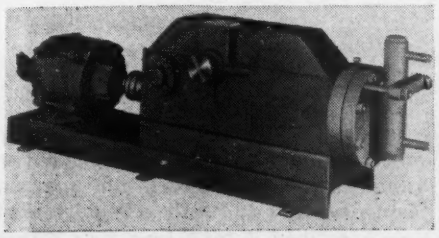
Standard sizes cover a gage range of 1¼ to 5 in. and a sight diameter of ½ to 1 in.

Proportioning Pump

A PROPORTIONING PUMP for heavy-duty solution feeding against pressures up to 5,000 p.s.i.—with a constant, manually adjustable rate of feed—is manufactured by Lapp Insulator Co., Inc., Le Roy, N. Y. It is a horizontal, direct-motor-driven, positive-displacement, reciprocating-diaphragm pump.

Corrosion-free materials are used in the reagent heads, which include an exclusive hydraulically-balanced diaphragm. This diaphragm is actuated by piston displacement through a hydraulic fluid, displacement being accurately measured by the piston in the cylinder. There is no mechanical connection with, or pressure differential against the diaphragm at any time. Packing glands are eliminated. The solution being handled is completely isolated from operating parts, and it is said that nothing can leak or corrode.

Five sizes are manufactured to provide a selection of capacities ranging from a few cubic centimeters to 10 gal. per hour.



Heavy-duty proportioning pump.

Continuous Heat Sealer

A CONTINUOUS heat sealer that will pick up bags from the filling machines and deliver them to the final packing position is announced by the Wrapade Machine Co., Inc., 1 Clinton St., Newark 2, N. J. Utilizing straight line heat and pressure closing, it will seal from 40 to 100 bags per minute. The tops of the bags can be folded over if desired.

The sealer is approximately 7 ft. long and is equipped with variable-speed drive to synchronize with any type of filling machine. It has safety devices for the protection of those working around it. All parts are easily available for cleaning, overhauling or replacement.

Labeler

VAC SPRAY MACHINE CO., 1700 Olson Blvd., Minneapolis, Minn., has developed a labeler that will apply labels from postage stamp size up to 5 in.

FERRY CONTINUOUS POTATO CHIP MACHINE

is completely automatic! Automatic from raw, unpeeled potatoes to finished product. Peeling, slicing, washing, drying, frying and salting . . . all are under perfect control. You can't beat a Ferry Potato Chip Machine.

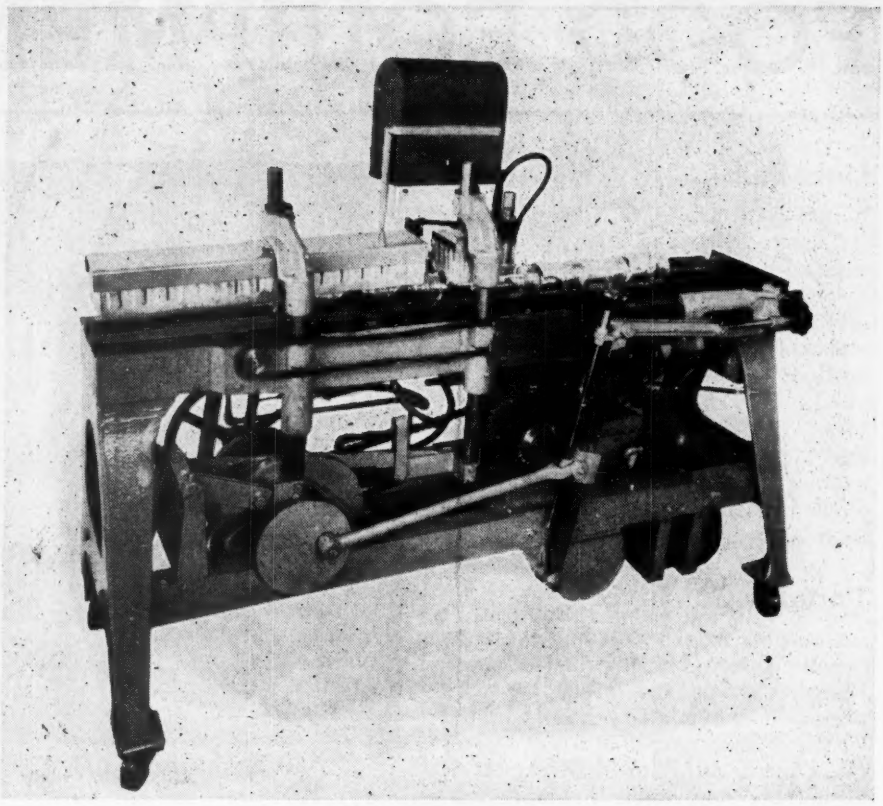
Also makers of

SLICERS AND AUTOMATIC SLICERS, FEEDERS AND CAN WASHING MACHINERY

J. D. FERRY CO.

129 SO. CAMERON ST.

HARRISBURG, PA.



Versatile labeling machine.

in diameter on containers from ¼ oz. to 1 gal. size, at rates from 1,200 to 3,000 per hour.

Changeover from one size or shape of label to another, or from one size container to another, is said to be accomplished in about one minute by simply turning a knob with no extra attachments required. Gummed or ungummed labels may be used. They may be foil, varnished, lithographed or plain.

Containers may be glass bottles, metal cans, cardboard boxes, and of any shape—round, square, triangle, or private mold.

The labeler is on casters and can be moved from one part of a plant to another, wherever an electric wall plug is available for power supply.

A feature is the magnetic label box which depends upon the force of gravity on lead weights and a built-in Alnico No. 5 magnet to hold the labels in place.

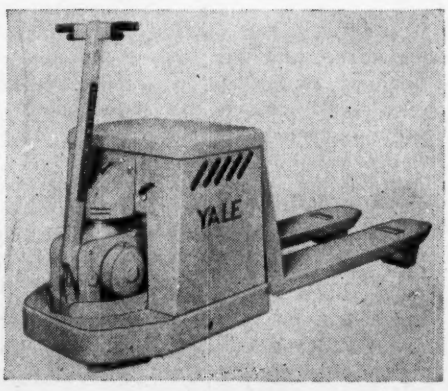
The machine weighs 1,250 lb., is 6 ft. long by 2 ft. wide and 4 ft. high.

Lift Truck

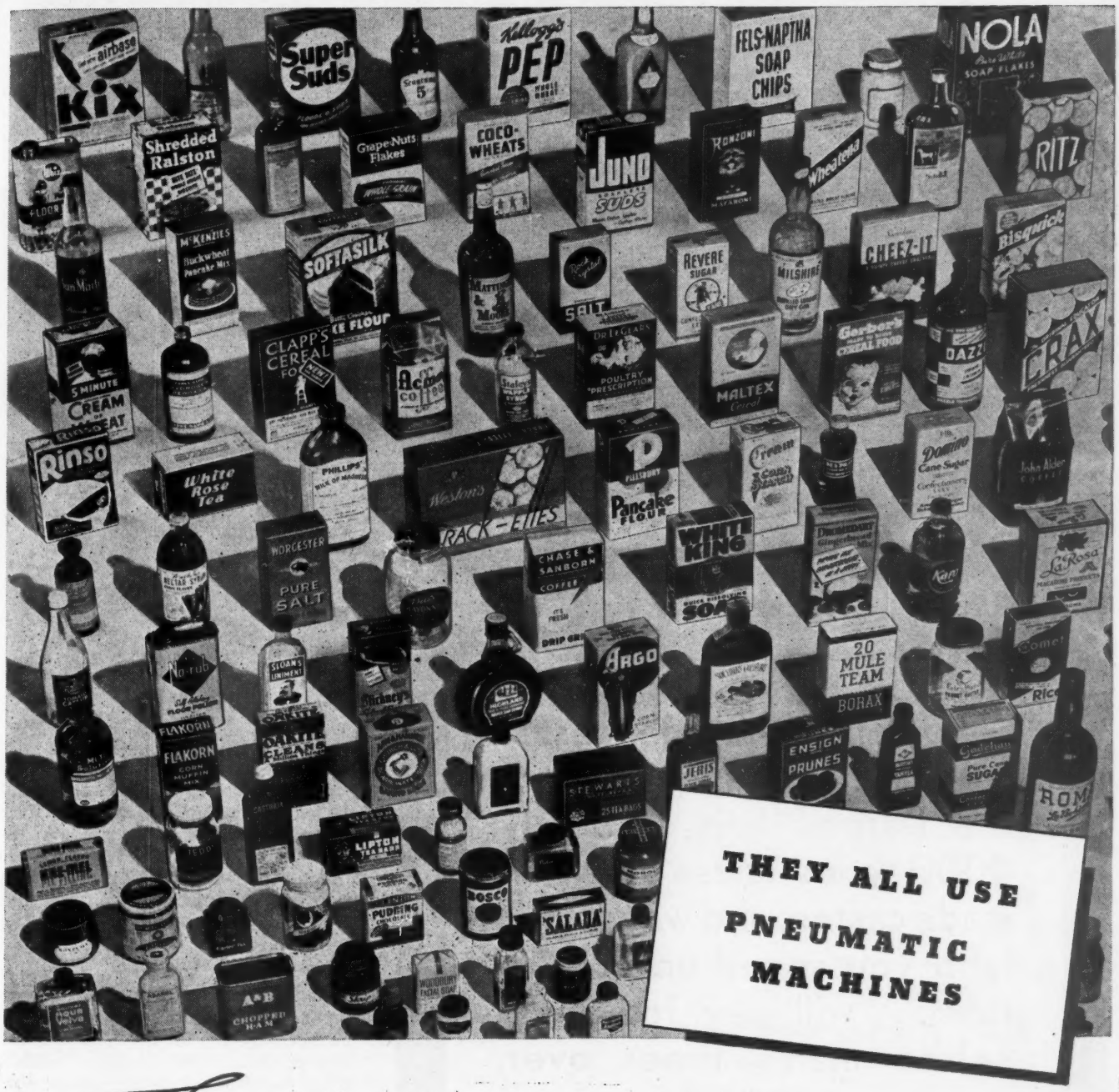
YALE & TOWNE MANUFACTURING CO., 4530 Tacony St., Philadelphia 24, Pa., has added an electric lift truck to its line. With power for lifting and power for travel, an operator can pick up and "walk off" with loads as heavy as 3 tons by using fingertip pressure on dual cam controls located immediately beneath the handbar-grip. These controls are so designed that when pressure is released they cut off the power. Two forward and two reverse speeds are provided. The unit is said to be compact and easily controlled. It can be maneuvered in congested areas, along narrow passages and around sharp corners without difficulty.

Lifting and lowering is controlled by a convenient switch, placed on the front of the battery compartment. The hydraulic ram operates in a honed cylinder, to provide long and efficient operation. The electric control and the valve mechanism are interlocked to eliminate overtravel of the lift.

When a load is deposited, a special type of hydraulic release cushions the descent, protecting load, floor and operators.



Electric lift truck.



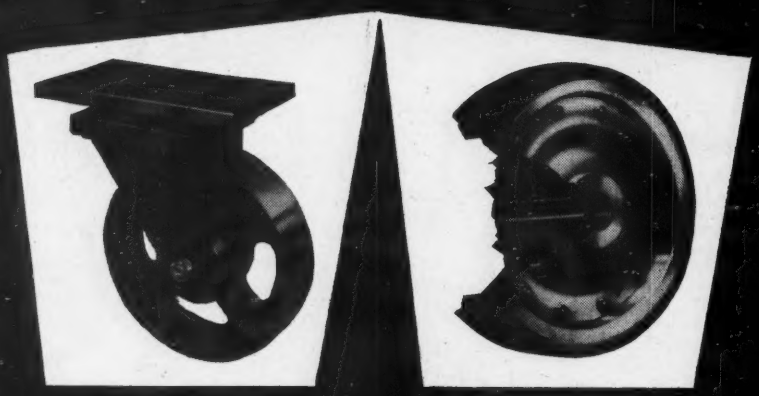
THE EVIDENCE looks you in the eye from this impressive group of containers representing the best names in their respective fields. Pneumatic machines play a leading part in the packaging and bottling of these famed products, as they do in many others not shown here. They have been the universal choice of America's foremost manufacturers for more than fifty years and they are more widely employed and highly respected today than ever before. What better proof could you be given that Pneumatic machines produce better packages at a LOWER COST PER CONTAINER?

Follow the lead of these experienced users and consult Pneumatic first on your packaging and bottling equipment needs.

PNEUMATIC
PACKAGING AND BOTTLING
MACHINERY

PNEUMATIC SCALE CORPORATION, LTD.
★ 72 Newport Avenue, North Quincy 71, Mass. ★
New York San Francisco Chicago Los Angeles

DARNELL CASTERS



A SAVING AT EVERY TURN

Choose just the right caster or wheel for your needs from the Darnell line of nearly 4000 types. These precision made casters and wheels will help you speed up production . . . will pay for themselves many times over.

KEEP TURNING AND EARNING

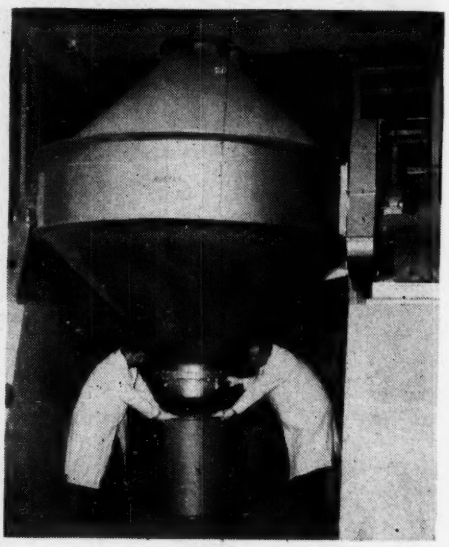
DARNELL CORP. LTD. LONG BEACH 4, CALIFORNIA

60 WALKER ST. NEW YORK 13, N. Y.
36 N. CLINTON CHICAGO 6, ILL.

& E-Z ROLL WHEELS

Conical Blender

AN unusually large double-cone blender (8 ft. in diameter) has been developed by H. K. Porter Co., Inc., Pittsburgh 22, Pa. It is constructed of stainless steel, has a dry blending



Double-cone blender.

capacity of 152 cu. ft., and will handle a load of 7,600 lb. The interior of the cone is ground to a smooth surface, eliminating the possibility of contaminating the mixture. It is well adapted to the mixing of various quantities, the tumbling action of the cone blender providing equality in the mixture of dry products such as flake and granular forms of gelatine.

Fire Extinguisher

A CARBON DIOXIDE hand fire extinguisher of unique design is announced by the B. F. Goodrich Co., Akron, Ohio. The container holds 4 lb. of carbon dioxide and comes with a carrying handle and control button designed for fast operation. It can be easily carried in one hand, with the thumb of the carrying hand operating the pushbutton.

A horn swivel raises or lowers as needed, remaining in lower position when attached to the wall rack furnished with each extinguisher, together with a quick release chain.

Painted vivid orange and black for high visibility, the extinguisher may be recharged at regular refill service establishments.

Load Lifter

RAISING finished goods from floor level to a loading platform and lowering raw materials from a freight-car to the floor are typical assignments for the Load Lifter built by Service Caster & Truck Division of

Their eyes have to reach...before their hands

Brighter, whiter Coated Lithwite Cartons give your product greater eye-and-buy appeal where it counts more than ever, today — at the point of sale

MORE ATTRACT-IVE PACKAGES. Packages that make shoppers' eyes *reach* for them. That's the point-of-sale advantage *Coated* Lithwite Cartons are giving many of America's leading products, today.

Coated Lithwite is the revolutionary paperboard that is formed, made and coated in one high-speed operation. Whiter. Brighter. Its smoother, harder, chalk-free surface makes a perfect base for printing inks . . . brings colors up brilliantly, reproduces halftones with sales-making realism.

Fewer "jammers" and "leakers." *Coated* Lithwite folds without flaking or shattering. Takes a tight, positive seal. Production of *Coated* Lithwite cartons is currently sold up. But get full facts about *Coated* Lithwite cartons now. Ask a Gardner-Richardson sales representative to call.

More eyes reach for your product in . . .

Coated Lithwite Cartons

THE GARDNER-RICHARDSON CO. • Manufacturers of Folding Cartons and Boxboard • Middletown, Ohio

Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT

RYERSON STEEL IN STOCK

Call Ryerson for any kind, shape or size of steel you need. Steel for manufacturing, maintenance or construction . . . all products are available for immediate shipment from any one of the ten convenient Ryerson Steel-Service Plants. Ask for a stock list . . . your guide to steel.

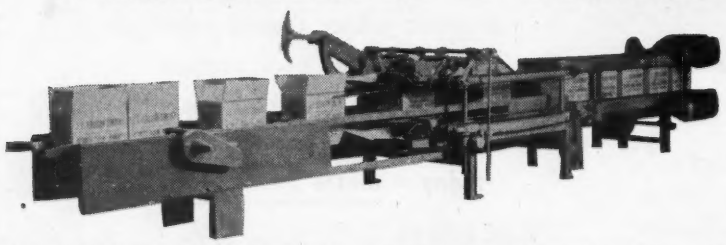
Principal Products Include:

Bars • Shapes • Structurals Plates • Sheets • Floor Plates • Alloy Steels • Tool Steels • Stainless Steel Screw Stock Wire • Mechanical Tubing • Reinforcing Steels • Shafting Babbitt • Nuts • Bolts Rivets • Welding Rod • Etc.

JOSEPH T. RYERSON & SON, INC.

STEEL-SERVICE PLANTS AT: CHICAGO, MILWAUKEE, ST. LOUIS, DETROIT, CLEVELAND, CINCINNATI, BUFFALO, BOSTON, PHILADELPHIA, JERSEY CITY

SEAL 50 TO 3000 CASES PER HOUR WITH PACKOMATIC'S MODEL D



PACKOMATIC Model "D" Case Sealers are applicable to practically any production requirement or plant layout. Compression units . . . geared for varying operating speeds (from 50 to 3,000 per hour) discharge cases completely sealed, squared—ready for shipping or storage.

PACKOMATIC'S *new* Model "D" is the result of 25 years of experience in perfecting packaging equipment for the nation's foremost producers. Its mechanism is simple . . . trouble-free . . . maintenance cost is low . . . An adhesive-saver, time-saver, space-saver.

Learn more about other PACKOMATIC filling, sealing and weighing equipment designed to speed your products to market.

Consult Classified Telephone Directory — or write Joliet.

PACKOMATIC

PACKAGING MACHINERY

J. L. FERGUSON CO. JOLIET, ILL.

New York • Chicago • Boston • Cleveland • Denver
Los Angeles • San Francisco • Seattle
Baltimore • Philadelphia

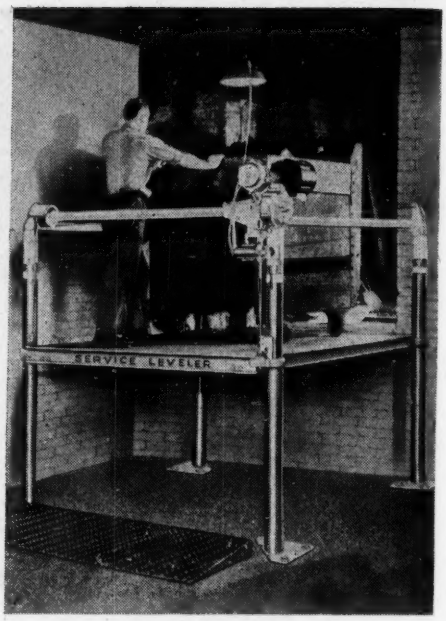
J. L. Ferguson Co., Joliet, Illinois

Please send complete data on ☐ Case Sealing ☐ Carton Filling and Sealing ☐ Package Weighing Equipment.

Company .....

Address .....

City..... State.....



Load lifter.

Domestic Industries, Inc., Albion, Mich., announce a load lifter. It can be installed either indoors or outdoors. It is shipped knocked down, and the average installation is said to take only a few hours.

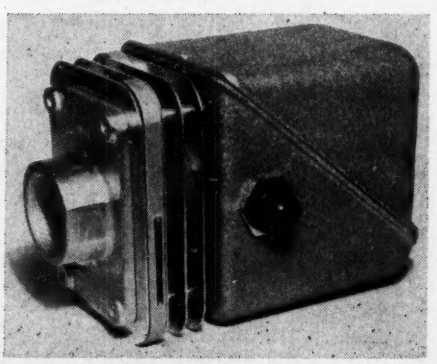
The fully inclosed power unit and motor are positive under all operating conditions. A free-wheel brake controls the lowering of the platform at a steady predetermined speed. A centrifugal governor operates an emergency safety brake.

Control of the platform travel is governed by an automatic traveling nut and flat-cam mechanism that automatically stops the motor at top height and floor level. Stops at intermediate heights are made by operating the switch.

Flame-Failure Safeguard

"FIREYE" is the name of a flame-failure safeguard designed to provide explosion protection for all industrial and commercial oil and pulverized coal burners. It is manufactured by Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.

It is not a thermal control, but is



Flame-failure safeguard.

How to "Take the Heat Off" your motor maintenance problems

Excessive time and dollar losses are being avoided in every industry—by *specifying* Fiberglas* *High Safety Factor* Electrical Insulation in new motors and for rewinds.

When scores of plants were operating at full-time war production, Fiberglas Insulation Materials provided "extra" protection to overcome conditions which caused most motor burnouts and failures—heat, moisture, corrosive vapors or acids, overload and the human element. One company was operating twenty-five variable speed motors which were subjected to heavy overloads under conditions of high ambient heat, high humidity. The average life of these motors, ranging from 2½ to 10 hp. had been about four weeks. Fiberglas-Base Insulation Materials were specified—the service life of these motors was lengthened many times—and "the heat was off" the motor maintenance problem in this plant.

Why not try the remedy that has been so successful for other concerns? Get complete information about Fiberglas Electrical Insulation Materials. Write for your copy of the new catalog and ask for the names of the distributors serving your locality. *Owens-Corning Fiberglas Corporation, 2009 Nicholas Building, Toledo 1, Ohio. In Canada, Fiberglas Canada Ltd., Oshawa, Ont.*

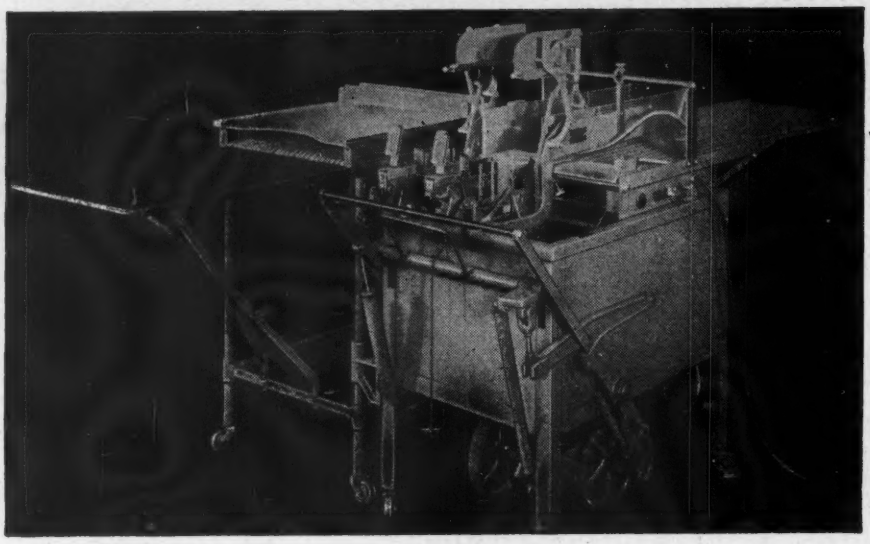
ASK FOR FIBERGLAS—IN YOUR NEXT MOTOR—AND ON YOUR NEXT REWIND.

ELECTRICAL INSULATION MATERIALS

FIBERGLAS

T. M. Reg. U. S. Pat. Off.

Other Fiberglas Products: Thermal and Acoustical Insulations • Dust-Stop* Air Filters • Yarns, Cloths, Mats and Basic Fibers



Miller

MODEL MPS WRAPPING MACHINE

WRAPS many sizes, cuts its own wrappers from rolls. Quickly adjustable without tools. Standard Model heat seals. Can also be furnished to glue seal. Mounted on casters, the Miller Model MPS can be rolled to the job. Plugs into any wall outlet for power.

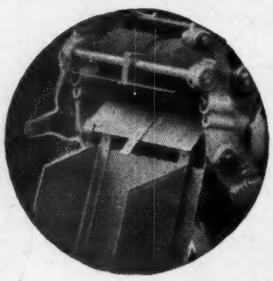
Send us samples of your packages for information on this versatile wrapping machine. Quick deliveries possible.

MACHINES FOR: Wrapping, Bag Making, Bag and Carton Filling, Bag Crimping or Closing, Gluing and Sheeting, Sandwich making.

IF YOU PACK IN BAGS MILLER OFFERS . . .

SIMPLEX HIGH SPEED BAG MAKER

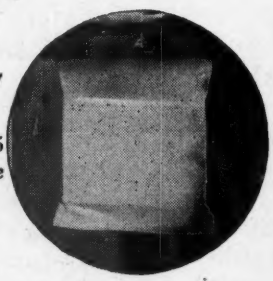
Makes 2500 to 4000 perfect bags per hour.



★

AMSCO ROTARY BAG SEALER

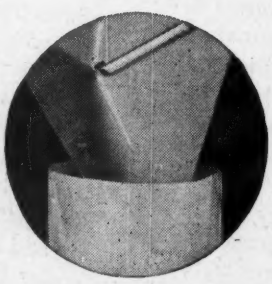
Seals up to 75 bags per minute automatically.



★

HOLM FILLING MACHINE

Automatically fills, by weight, 18 to 20 bags or cartons per minute.



Miller Wrapping & Sealing Machine Co.

12 SOUTH CLINTON STREET, CHICAGO 6, ILLINOIS

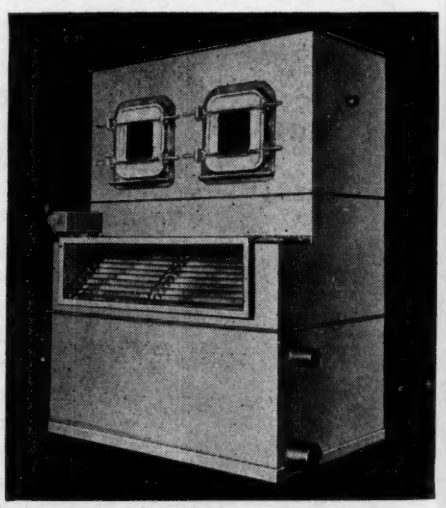
actuated by the flame itself. When the flame fails, it instantly cuts off fuel and sounds an alarm. Its action is said to be positive and instantaneous.

The unit consists of a phototube and amplifying system, housed in a dust-tight aluminum case. The entire control is mounted directly on the furnace wall. It is aligned in a manner which permits the photoelectric cell to observe the flame through a 2-in. pipe connection which serves as both a sighting tube and a support for the equipment.

A clear Pyrex filter keeps the equipment dust-tight and is mounted on a hinged shutter which permits it to be cleaned without shutdown. A heat absorbing filter in the lens system and an efficient baffle system protects the unit from all radiated heat.

Air Conditioning

A UNIT to dehumidify or humidify air, independently of temperature, for large industrial applications, has been developed by Surface Combustion Corp., Toledo 1, Ohio. The system utilizes a chemical absorption medium for controlling the moisture content of the atmosphere. The solution is a single salt with a low-vapor pressure. Its capacity and rate of absorption are determined by its temperature. The solution does not



Continuous dehumidifier and humidifier.

deteriorate with age and can be used continuously. It is noncorrosive, actually acting as a protector for the surface of the equipment.

The outside air is brought into contact with the solution, is washed by it, and moisture is added to, or removed from the air, in accordance with the desired single control setting. Solution-temperature is maintained by *modulating the water* to

LIKE THE *Aaron Willard* *Hallmark* ON A FINE CLOCK

An honored name is one that has established a reputation through continuous superior performance. In food equipment that name is KOVEN. For more than 65 years, KOVEN has been designing and manufacturing efficient, economical food equipment . . . designed to meet specific requirements.

A KOVEN representative will be glad to call on you . . . to assist you in determining the exact equipment that will best fit your individual production needs. This consultation will not obligate you. Call or write to KOVEN.

Among the many KOVEN products in all the leading commercial and noncorrosive metals: Stainless Steel; Aluminum Sheet Fabrication; Boxes, Tote, Waste Cans; Chemical Apparatus; Coils and Pipe Bands; Copper Sheet Fabrication; Galvanizing Work; Mixers, All Kinds; Monel Metal Fabricator; Pails, Special Heavy; Pans, All Types, All Metals; Sinks, Scullery and Factory; Tables, Galvanized or Monel; Tanks, All Types, All Metals; Kettles, All Types, All Metals.

L. O. KOVEN & BRO., INC.

154 OGDEN AVENUE JERSEY CITY 7, N. J.

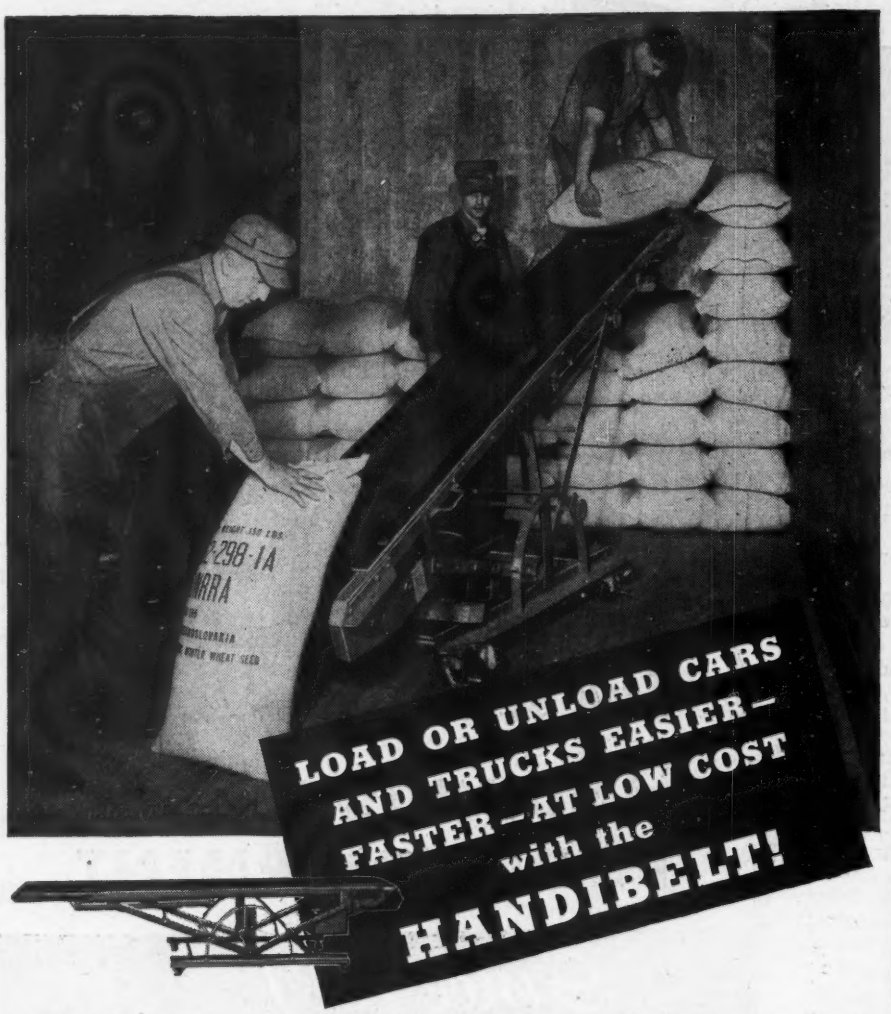
PLANTS:
Jersey City, N.J. Dover, N.J.

KOVEN

has been the hallmark of superior

INDIVIDUALIZED FOOD EQUIPMENT

Since 1881



Hard-to-get-at spaces are easily reached with the Handibelt—the all purpose incline, decline or horizontal portable belt conveyor. Its design allows the carrier belt to be horizontal at any height from 18 inches to 42 inches. It can be used as a piler elevating from 10 inches to 6 feet 3 inches or from 30 inches to 7 feet 6 inches, or any angle or degree between those extremes. Either end may be raised or lowered.

The Handibelt handles boxes, cartons, crates, bags, and other packages up to 100 lbs. The rubber covered belt is free of side rails — commodities wider than 14 inches may be carried.

This flexible unit may be used as a piler, a horizontal conveyor, a connecting link between other conveyors, as a feeder conveyor. Any number of Handibelts can be placed in line to form a continuous conveyor to reach remote spaces.

Weighs less than 500 lbs. — easily wheeled about by one person. Equipped with ⅓ hp. motor—plug it into any ordinary lighting circuit.

Get complete information today — write for Handibelt Bulletin No. FI-26.

STANDARD CONVEYOR CO.

General Offices: North St. Paul 9, Minn.
Sales and Service in Principal Cities

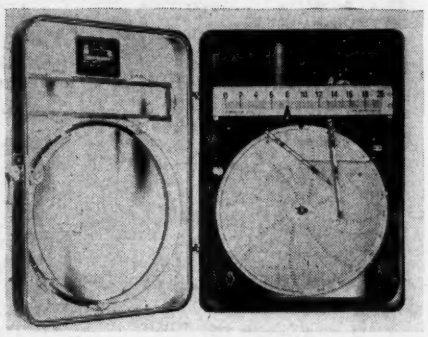
ROLLER · BELT · SLAT · PUSHBAR CONVEYORS • PORTABLE CONVEYORS AND PILERS • SPIRAL CHUTES • PNEUMATIC TUBE SYSTEMS

the contactor-cooler. This operation is automatic.

A small percentage of the solution is regenerated to return all the solution to normal strength. The cycle is continuous. During regeneration of the solution, it is filtered, making it possible to use this system in dust-laden atmospheres.

Proportional Controller

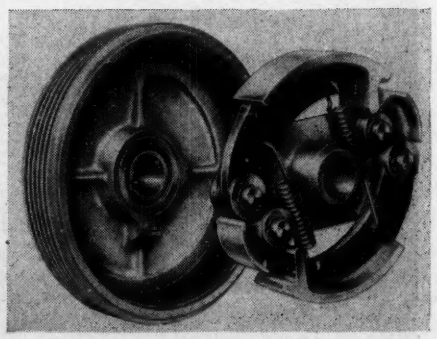
THE Bristol Co., Waterbury 91, Conn., has developed a proportional current - input controller - recorder. Designed to provide extremely accurate control of electrically heated furnaces and ovens, this new instrument provides on-and-off type control with the advantages of proportioning control. A rotating cam interrupts the flow of current to the heating coils, the duration of the interruption being determined by the departure of the controlled temperature from the control point.



Proportional current-input controller.

Automatic Clutch

TO eliminate the sudden shock of starting machinery or moving equipment, a unique automatic clutch has been developed by Salisbury Motors, Inc., 4464 District Boulevard, Los Angeles 11, Calif. Operated by centrifugal action, the device progressively applies power to the driven machine. Said to offer the advantages of fluid drive, this clutch also permits complete disengagement



Centrifugal clutch.

Operator logs temperature and pH from four Micromax Recorders in the penicillin-producing plant of Charles Pfizer & Co., Brooklyn.

TONS BEHAVE LIKE *OUNCES* IN PFIZER'S PENICILLIN VATS

Tons of material used in the Pfizer penicillin plant are extracted with very much the same dependable yield which the lab secures from batches of a few ounces.

To accomplish these results, temperature and pH are regulated within limits usually found only in lab work.

Information on which such regulation is based does not however come from laboratory instruments. Micromax Recorders are employed.

These instruments use the balance method, for highest accuracy and dependability. As detectors of temperature and pH, they employ industrial-type primary elements which are in themselves major achievements of sensitivity and accuracy in instrument engineering. And the complete equipments are sturdy and highly dependable.

To make their usefulness complete, the wide, clear charts of Micromax instruments tell their stories at a glance, for the guidance of the process operator.

An L&N engineer will be glad to tell you what Micromax can do in a specific case; or he'll send catalogs, as you prefer.

LEEDS & NORTHRUP COMPANY, 4912 STENTON AVE., PHILA. 44, PA.

LEEDS & NORTHRUP

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

Jrl Ad N-00(2)

SEAMLESS

THE ONLY ONE OF ITS KIND IN THE WORLD..

HUBBERT

STAINLESS STEEL KETTLES FOR 1946

ARE AVAILABLE NOW!

COMPARE

1. Seamless inner and outer shells . . . no welds to crack or corrode.

COMPARE

2. Safe . . . no chance for "blown" inner shells at rated working pressures . . . ample metal thickness.

COMPARE

3. Sanitary . . . no cracks or depressions for dirt to cling to . . . easy to clean and to keep clean, inside and out.

COMPARE

4. Smart appearance . . . 1946 designs. Up to the minute in every respect.

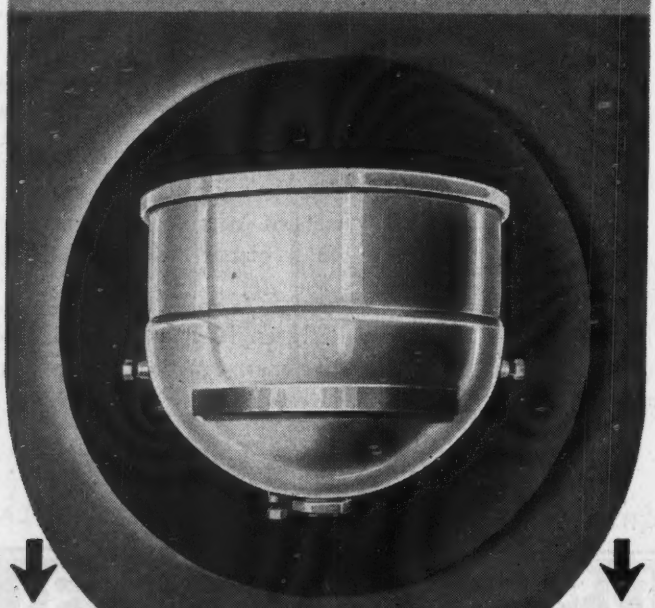
COMPARE

5. Scientifically engineered for efficient cooking and even heat distribution. Proper working height. Perfect all-around performance.

Originators of the Seamless Drawn Stainless Steel Kettle

Watch for new developments—Sanitary Valves and Stirring Mechanisms—soon!

B. H. HUBBERT & SON, Inc.
Manufacturers
1300 Block South Ponca Street
BALTIMORE 24, MARYLAND



EVERY HUBBERT SEAMLESS DRAWN STAINLESS STEEL KETTLE EVER [illegible] ACTIVE DUTY TODAY

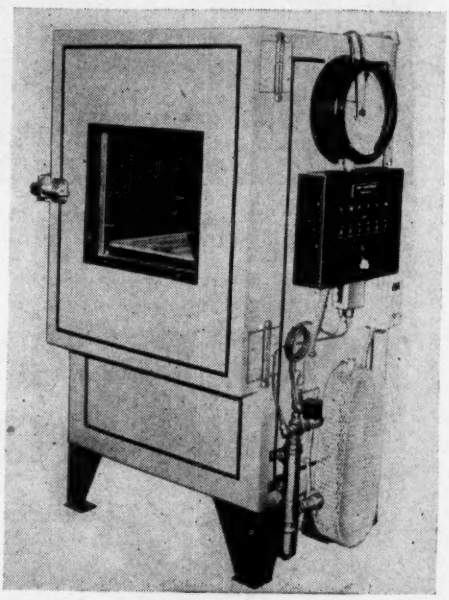
while idling and positive engagement when driving.

The clutch is an opposed-shoe type, dual spring balanced. Below a predetermined speed of an engine or motor, the clutch idles. When the speed increases beyond the stipulated valve, the shoes press outwardly, contacting the friction lining of the drum.

Two models are available, one for the range from fractional to 3 hp. and one for up to 6 hp. The 3-hp. model has a drum diameter of 7¼ in. and a length of 2-11/16 in.; the 6-hp. model has a drum diameter of 7¼ in. and a length of 4½ in.

Control Cabinets

INSULATED variable-temperature and humidity cabinets for the simulation and control of different atmospheric conditions have been announced by Tenney Engineering, Inc., 26 Avenue B, Newark 5, N. J. The units are designed to duplicate accurately any



Temperature-humidity cabinet.

desired combination of temperature, humidity and air circulation. Dry bulb temperature will not vary in any part of the cabinet more than ±1 deg. C. Relative humidities up to 90 percent are attainable, and the wet bulb temperature can be held to ±½ deg. C. A simple setting of controls brings cabinet to a new equilibrium within 10 to 15 minutes.

The cabinets are available in laboratory and production sizes. They have glass doors to permit inspection of contents.

Bag Dumper

A PORTABLE bag dumper powered by a ¼-hp. electric motor has been perfected by ASCo Mfg. Co., 601 S. Anderson St., Los Angeles 23, Calif.

air

MINUS oil

= Satisfied Customers

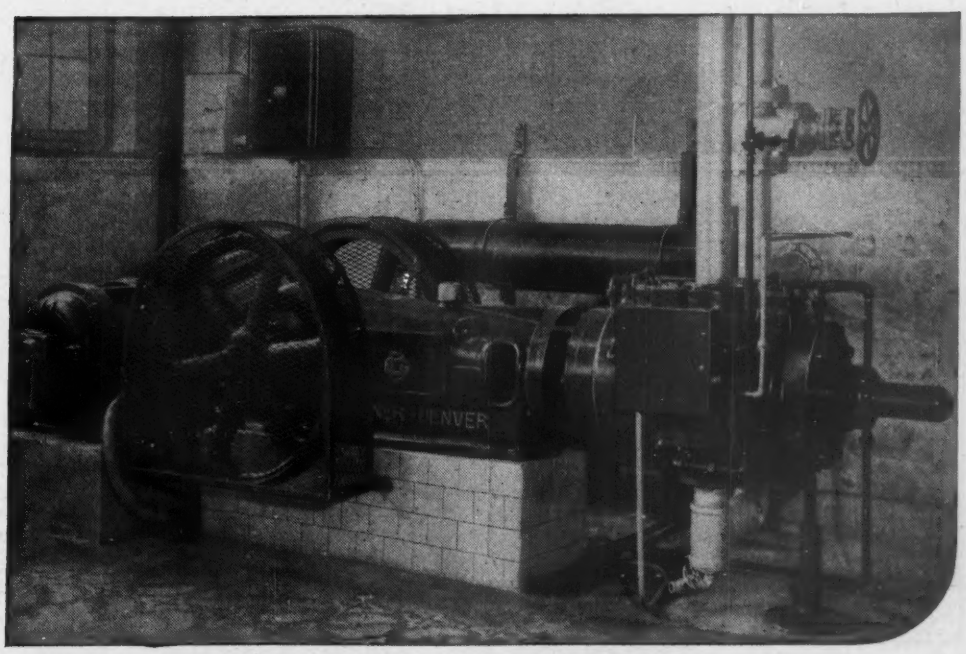
Food cannot absorb an oily flavor from air delivered by the Gardner-Denver "RX" Carbon Ring Compressor—for that air contacts no oiled surface of the "RX." The piston rings, where such contact is usually made, are of carbon and require no lubrication. No oil can be carried along the piston rod into the cylinder—a special metallic packing wipes the rod clean of any crankcase oil.

For complete information, write Gardner-Denver Company, Quincy, Illinois.

- *Cylinder stuffing box (and tail guard stuffing box when used) provided with special packing rings which require no lubrication.*
- *Constant speed, Automatic Start and Stop or the unique Gardner-Denver Duomatic control are furnished to suit individual requirements.*
- *Obtainable in capacities from 89 to 1292 cubic feet displacement per minute.*
- *Remarkably low horsepower requirements—lower upkeep costs.*

GARDNER-DENVER

Since 1859



NOW AVAILABLE! Immediate Shipment

FLOOR MATTING of all Kinds

for

- INCREASING PRODUCTION
- PROMOTING SAFETY
- PROVIDING COMFORT
- FURTHERING SANITATION
- REDUCING FATIGUE

Prevent the large percentage of industrial accidents which result from slipping.

NEO-CORD COUNTER-TRED MATTING. The only successful oil, grease, and acid resistant, long wear matting.

AMERIFLEX FLEXIBLE HARD WOOD LINK MATTING. The links are held on galvanized steel spring wire framework. Lies flat. Follows contour of the floor. Beveled edges. Can be rolled or folded.

AMERITRED SOLID PLASTIC FRICTION MATTING. For ramps, stairs, landings, shower and locker rooms, entrances, in front and back of counters. Good scrapeage. Lies flat. Comes in sheets 29"x62"x9/64". Can be laid side by side for larger areas, or trimmed for smaller or odd-shaped areas. Color: Black.

AMERICAN COUNTER-TRED MATTING. 3/8" thick, 24" wide, any length. Used in lavatories, refrigerators, shower and locker rooms, and behind serving counters. Ridged bottom affords aeration and drainage.

EZY-RUG RUBBER LINK MATTING. Traps all dirt at the door, keeps it out of sight and prevents tracking through the building, reducing cleaning costs and frequency of redecorating necessitated by dirt whirled into the air by the heating system. Modernizes and beautifies entrances, lobbies and corridors. Available with lettering. Beveled edge. Will not curl. Reversible, its durability is doubled.

TUF-TRED TIRE FABRIC MATTING • AMATCO WIDE RIBBED CORRUGATED MATTING • RUB-O-RUG CROSS CORRUGATED MATTING • UTILITY CROSS CORRUGATED MATTING • SAFETY STAIR TREDS AND RUNNERS • HERRINGBONE TIRE FABRIC MATTING • AIR-TRED SPONGE RUBBER MATTING • PERFORATED CORRUGATED MATTING • LINK TYPE TIRE FABRIC MATTING • SEMI-PERFORATED NAME MATS • CROSS-RIB DOOR MATS • SWITCHBOARD MATTING • WOOD SLAT MATTING • PYRAMID MATTING • STEEL MATTING • LEATHER MATS.

Write for prices and folder "A Mat For Every Purpose"

AMERICAN MAT CORPORATION

"America's Largest Matting Specialists"

1797 Adams St., Toledo 2, Ohio

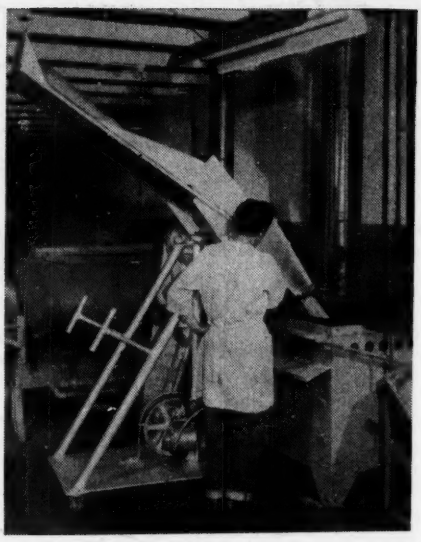
Write Today!

Foresighted manufacturers are spending money in these pages to tell you about their products and service. They are ever ready to help you solve your problems. Find out what they can do to help you! Write today!

STABILIZERS
WATER SOLUBLE GUMS
TRAGACANTH • LOCUST (CAROB) • ARABIC • KARAYA
IRISH MOSS

QUALITY CONTROLLED FOR UNIFORMITY IN YOUR PRODUCT

S. B. PENICK & COMPANY
50 Church Street, New York 7, N. Y. Telephone: COrtlandt 7-1970
735 W. Division St., Chicago 10, Ill. Telephone: MOHawk 5651

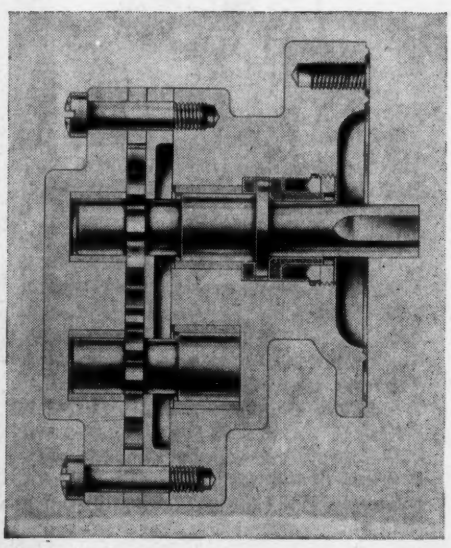


Portable bag dumper

The machine is said to quickly lift and empty bags of grain, nuts, sugar, beans, or any bagged material weighing up to 350 lb. An automatic shut-off switch stops the motor at top and bottom positions of the lift. As an added safety feature, a special clutch arrangement disengages the motor if the downward return of the chute is obstructed. The upward lift takes 10 seconds, with 8 seconds for lowering. An adjustable-height chute at the front fits narrow openings and funnels the bag's contents into a vat or machine without spilling. Two spikes catch and hold the bag while dumping. The chute will handle a bag 24 in. wide.

Rotary Pump

PUMPS that work on the rotary principle, capable of operating under high or low pressure with a non-pulsating delivery, are manufactured by Marco Co., Wilmington, Del. They are said



Sanitary rotary pump.

Is your Job too tough for your Truck?...

No matter how little it cost when new—if your truck is not tough enough for your job *it will cost too much in the end.*

There's only one "bargain" in trucking—and that's *extra work for your money.*

This is why Mack trucks are built the way they are. It's why, for instance, Mack uses Tetrapoid rather than conventional gears—rubber Shock Insulator rather than conventional spring shackles—wrist pins precision-finished to two ten-thousandths of an inch.

When you build a truck this way *it gives its owner extra work.* It stays on the job *longer.* It is in the repair shop *less. It costs less in the end.*

If your trucks give you too much trouble—if repair costs are excessive and service interruptions too frequent—then ask yourself if maybe you're not just using *too little truck for the job!*

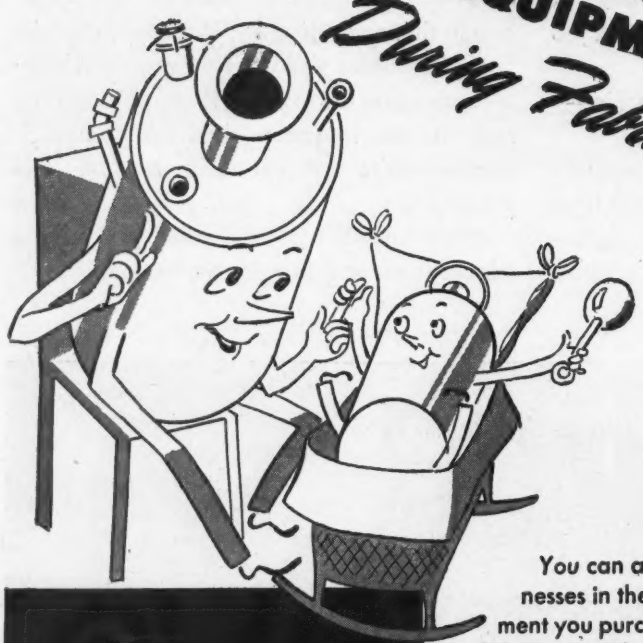
If the answer's "*Yes!*"—then you need a Mack. It pays off in work on the job.

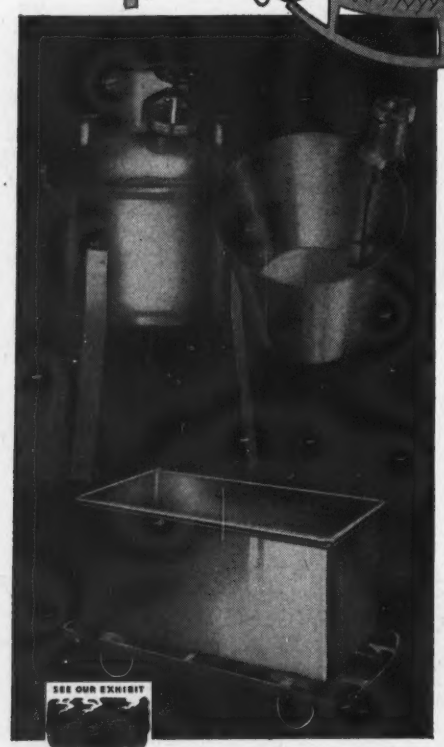
Mack Trucks, Inc., Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

Mack
TRUCKS
FOR EVERY PURPOSE

Performance Counts!

PROTECTING YOUR STAINLESS STEEL EQUIPMENT *During Fabrication*





You can avoid hidden weaknesses in the processing equipment you purchase by selecting a fabricator with specialized experience in working with this alloy. Stainless steel is a tricky metal to work. When you bend it, form it, weld it, your fabricator must use shop procedures that safeguard the original properties of the metal. And he must have the plant machinery, engineering skill, and trained manpower to carry out these protective procedures.

As custom builders of processing equipment working *exclusively* with stainless steel alloy—we offer this specialization to our customers. It assures you processing equipment with no hidden weaknesses—equipment that lasts longer, works more efficiently for your application. Consult with us.

S. BLICKMAN INC.
4102 GREGORY AVE., WEEHAWKEN, N. J.

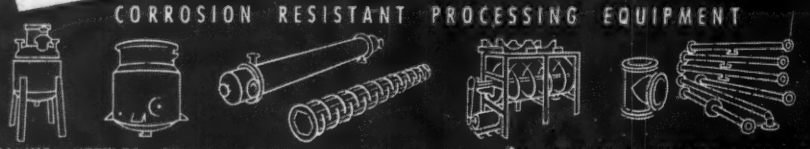
SEE OUR EXHIBIT
NEW YORK COLISEUM
EXPOSITION OF CHEMICAL INDUSTRIES

Booth 474-475

S. BLICKMAN, INC.
Guards Alloys in Fabrication

SEND FOR THIS VALUABLE BOOK
A request on your letterhead will bring our guide, "What to Look For When You Specify Stainless Steel for Your Processing Equipment."

CORROSION RESISTANT PROCESSING EQUIPMENT

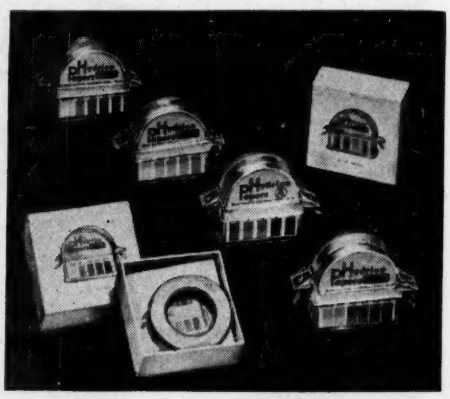


TANKS • KETTLES • STILLS • HEAT EXCHANGERS • AGITATORS • MIXERS • TOWERS • PIPING

to have positive displacement and high vacuum. The shafts are equipped with a self-adjusting seal enclosed in steel armor that will hold against pressure and vacuum so that there is no danger of the product being pumped becoming contaminated. The smallest model needs no lubrication. The other designs are equipped with automatic lubrication. They are all built of stainless metal unless otherwise specified. They are said to be easily taken apart for cleaning, as there are no pockets or threads to impede the product being processed. Capacities range from 5 to 3,765 g.p.h.

pH Test Papers

SIX new short-range pH test papers are announced by R. P. Cargille, 118 Liberty St., New York 6. Color changes for small pH intervals are said to be so well defined with these papers that readings can be made to 0.25 pH. The six papers cover the range pH 1 to 14. A transparent plastic dispenser holds two papers in roll form.



Six short-range pH test papers.

Delivery Truck

A NEW house-to-house delivery truck has been developed by Marmon-Herrington Co., Indianapolis 7, Ind. It has an extra roomy body, with a low "step-in" floor level only 13 in. above the pavement. This is accomplished by utilizing a front driving axle, eliminating the conventional propeller shaft and rear axle with its differential.

The truck has a short wheelbase. It has a 60-hp., 4-cylinder engine, which gives it fast pickup. Controls are arranged for standing or seated driving.

An auxiliary transmission provides two speed ranges, a low range for frequent-stop operation and a higher range for driving to and from the route. This gives a total of six forward and two reverse speeds.

CATALOGS, BULLETINS

This selected information on new publications is offered by FOOD INDUSTRIES Readers' Service through cooperation with the manufacturers. It helps executives save valuable time. To obtain literature described, simply fill in form below, clip it to your letterhead and mail to FOOD INDUSTRIES. There is no cost, no obligation.

Food Plant Equipment

Fans and Blowers.....1

Bishop and Babcock Manufacturing Co., Cleveland, has issued three bulletins which deal with fans, air washers and blowers. Bulletin No. 101 covers a description of power-fixed fans for general industrial applications and consists of 60 pages of text and illustrations. Various engineering aspects of industrial air washers are discussed in a 20-page bulletin No. 67. Bulletin No. 87A presents structural and engineering data on blowers. In its 12 pages data is given which will be helpful in the proper selection of blowers for specific applications.

Rotary Dryers.....2

Bulletin B6378, covering Allis-Chalmers Mfg. Co., Milwaukee, latest development in rotary dryers and coolers, has just been released. The bulletin illustrates typical installations and uses, such as drying or heating soybeans, cotton seed before oil is extracted, drying such vegetable granular products as peanut shells, and similar agricultural products.

Pumps 3

Oliver United Filters, Inc., New York, has released a bulletin describing and illustrating a disphragm slurry pump. Included are two charts giving rated capacities of the various sizes described.

Refrigeration 4

Worthington Pump & Machinery Corp., Harrison, has issued Bulletin RP 284 which is a reprint from an article that appeared in Power. It describes the technical aspects of how steam jet air ejectors operate.

Bulletin WP-1099-B48 covers compressors and various types of refrigeration equipment, including steam jet vacuum refrigeration.

Bulletin C-1100-B14 is devoted to centrifugal refrigeration, giving considerable engineering data, and equipment specifications.

Sealed Motors.....5

Crocker-Wheeler Division of Joshua Hendy Iron Works, Ampere, has issued a 4-page bulletin describing a line of motors developed for use in dusty locations and where there is excessive moisture. These motors are available in sizes from 2 hp. to 15 hp.

Bakers' Equipment.....6

A line of mixers, and other bakers' equipment, is described and illustrated in a 34-page booklet published by Read Machinery Co., Inc., York. Descriptions of accessories and auxiliary attachments are included.

Plant Supplies

Fluorescent Lamps 7

The differences in the principles and mechanics of fluorescent lamps as contrasted to incandescent lamps are given in an illustrated bulletin published by Westinghouse Electric & Manufacturing Co., Lamp Division, Bloomfield.

Ascorbic Acid 8

"Ascorbic Acid in the Food Industry" is the name of a booklet released by Chas. Pfizer & Co., Inc., New York. Its properties as an enricher and as a fruit discoloration preventer are described in detail.

Floor Hardener.....9

Building Products Division, L. Sonne-

FEBRUARY, 1946

FOOD INDUSTRIES READERS' SERVICE

FOOD INDUSTRIES, 330 W. 42nd St., New York City 18

Please have manufacturer send me, without obligation, literature circled below.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

NAME..... TITLE.....

FIRM OR AFFILIATION.....

ADDRESS .....

SALES EXPENSE OUT OF LINE?

The products we distribute to hundreds of New York grocery retail outlets are being moved at a sales expense that challenges the imagination. Specialization is the answer! We would like to compare our costs with yours if you are not represented by a food broker—and explain how we do it. No other selling group offers our high distribution at our low sales cost—and that's a bet!

MURRAY-ALLEN COMPANY

370 LEXINGTON AVE. NEW YORK 17, N. Y.

TELEPHONE MURRAY HILL 3-8983

Reco AIR CIRCULATOR
RADI-AIRE

PROVIDES UNIFORM TEMPERATURE & HUMIDITY

DISSIPATES ODORS

ELIMINATES STEAM, FOG AND SMOKE

PREVENTS WATER ON WALLS AND CEILING

IMPROVES QUALITY OF PRODUCT

NO DRAFT NO NOISE

This revolutionary new fan blows upwards, the air traveling along the ceiling, down the walls and up the center again, providing complete and gentle air motion in every part of a room. Made in 20" and 24" diameters and in various types. The fan illustrated is the high stand model with Mercury explosion-proof switch. Can also be supplied in ceiling and low stand models. Please write for our latest literature.

REYNOLDS ELECTRIC COMPANY

Mfr. of Refrigerator Fans, Processing Room Fans, Heat Circulators, Food Mixers, Veg. Peelers, Chopper-Slicers.

2668 W. Congress St., Chicago 12, Ill.

the SAFE WAY to cope with FOULING and LOAD FLUCTUATIONS

IN COOLERS FOR OIL, WATER AND OTHER LIQUIDS

ROSS

To operate continually at desired performance, a cooler *must* incorporate factors of safety to allow for the effects of fouling, as well as fluctuations in load and operating conditions. Otherwise, performance can drop below practical limits, and shutdowns can be excessive.

Ross *always* stresses a thorough analysis of the fouling tendencies of the fluids being circulated, the velocities to be maintained, temperature ranges and anticipated fluctuations in load as well as changing climatic or operating conditions . . . *and in your particular installation, you may prefer to avail yourself of Ross' experience in determining and analyzing your operating problems.*

This service, cheerfully given by Ross Engineers, assures the selection of a cooler best suited to your needs. Remember—your conditions can be met exactly by Ross, through the tailor-made feature of Types "CP" and "BCF" Coolers, for large and small requirements, respectively.

THESE BULLETINS WILL HELP YOU

"CP" COOLERS No. 5322

"BCF" COOLERS No. 4922

Ross equipment is manufactured and sold in Canada by Horton Steel Works Ltd., Fort Erie, Ontario

ROSS HEATER & MFG. CO., Inc.

Division of American Radiator & Standard Sanitary Corporation

1443 WEST AVENUE BUFFALO 13, N. Y.

born Sons, Inc., New York, has released a 4-page folder which tells about chemical floor hardeners. It describes how to apply it, and shows graphically how it permeates the top layer of concrete, resulting in protection against concrete dust, action of acids or alkalis and vegetable and animal fats of various kinds.

Stainless Steels 10

Republic Steel Corp., Cleveland, announces a 32-page booklet, generously illustrated with photographs. It graphically tells how wartime applications of stainless steel will be translated into peacetime pursuits.

Metal Hose 11

Bulletin No. 55-G has just been released by Pennsylvania Flexible Metallic Tubing Co., Philadelphia. It suggests many practical uses for flexible all-metal hose in handling light or heavy liquids and gases. Basic information for the proper application of flexible hose to supply lines, industrial loading problems and supplementary steam connections is given.

Plastics 12

The Watertown Manufacturing Co., Watertown, has published a 48-page booklet on plastics. It covers molding methods, properties, and stock molds. Thermoplastic and thermosetting materials are fully described.

Control Equipment

Control Instruments 13

Taylor Instrument Cos., Rochester, has published a 36-page catalog dealing exclusively with the application of control instruments to the refrigeration fields. Available instruments are described and helpful information given on how to select the proper instruments for any particular application.

Thermo Switches 14

Fenwal, Inc., Ashland, has published a 42-page bulletin on thermo switches. It covers a line of standard temperature and pressure-control apparatus, and describes several types of devices for temperatures between sub-zero and 2,000 deg. F. Photographs and drawings show the equipment and its construction features.

Cut-off Register Control.....15

General Electric Co., Schenectady, has issued a bulletin which describes an automatic cut-off register control to be used on industrial packaging machines. Drawings and photographs illustrate one-way and two-way register controls.

Motor Controls.....16

Electron Equipment Corp., South Pasadena, has released a 4-page leaflet which describes electronic speed controls. They are said to utilize current from AC lines to drive all makes or sizes of standard DC motors at any speed variation desired.

FOOD TECHNOLOGY
NEW DISCOVERIES AND INVENTIONS

VITAMINS

Storage Temperatures

VITAMIN CONTENT of canned vegetables is affected less by time of storage than by temperature, studies over a 365 day period show.

Canned tomato juice, green lima beans and whole kernel yellow corn were stored at 30, 42, 85 and 110 deg. F. and assayed for ascorbic acid, carotene, thiamine, riboflavin and pantothenic acid at intervals over a period of one year. Charts are given showing the changes in vitamin value for each product at the various storage temperatures.

The highest temperature brought about the greatest decrease in vitamin content, although the riboflavin change was very small for beans and corn, and only slight for tomato juice. Tomato juice suffered most from storage temperatures above 85 deg. F. Thiamine losses at 110 deg. F. were quite pronounced for all three vegetables, but were little affected at lower temperatures.

Digest from "Nutritive Value of Canned Foods, Influence of Temperature and Time of Storage on Vitamin Content," by N. B. Guerrant, M. G. Varich, and R. A. Dutcher, *Industrial and Engineering Chemistry*, vol. 37, 1240-43, December, 1945.

FATS AND OILS

Rancidity Determinations

ACCELERATED methods for testing soybean flour, flakes or grits for development of fat rancidity have been devised. Since soybean products may be stored for 1½ yrs. or more before there is organoleptic evidence of deterioration, these tests can be of help in evaluating commercial processing methods, and in studying methods proposed for retarding oxidative rancidity in soybean products.

Samples were oxidized at 212 and 230 deg. F. until organoleptic tests showed rancidity. The peroxide content was then determined and the fat extracted for study of iodine number, linoleic, and linolenic acid values.

Keeping times for full-fat (22 percent) flours were 36 to 104 hrs. at 212 deg. F., and 22½ to 50 hrs. at 230 deg. F. These were reproducible within one hour. When rancidity became apparent organoleptically, rapid formation of peroxides was occurring. Grits and expeller flours of 6 to 7 percent fat kept about 50 percent longer, while solvent extracted flour never attained appreciable peroxide concentration. These low fat flours developed a "cardboard" taste, indicative of deterioration, long before rancidity developed. The air passing over the higher fat flours went through a series of "grassy," "beany," and "rancid" odors, the last at the onset of the rapid peroxide formation, but before the flour itself became rancid to the taste.

The iodine value of the extracted fat decreased during the oxidation period, as did the linoleic and linolenic acids, the latter corresponding very closely to the change in iodine value.

Digest from "Stability of Soybean Flours, Effect of Accelerated Oxidation," by L. J. Filer, Jr., C. J. Martin, and B. F. Daubert, *Industrial and Engineering Chemistry*, vol. 37, 1180-83, December, 1945.

MEATS

Antioxidants Retard Rancidity of Bacon

CURED PORK, treated with antioxidants, resisted rancidity at room temperatures four to five times as long as untreated pork. Smoking retarded the development of rancidity, light promoted it.

Tests were made by subjecting slices of bacon from slabs, cured by a standardized method, to the antioxidant in melted vegetable oil at 140 deg. F. before exposing them to the air at room temperatures for periods of from 7 to 77 days. Degree of rancidity was measured by determining the peroxide value of the expressed fat.

Three antioxidant solutions were used: (A) a 0.02 percent solution of nordihydroguaiaretic acid in hydrogenated vegetable oil, (B) 0.06 percent d-isoascorbyl palmitate, 0.06 percent soybean lecithin, and 0.01 percent mixed tocopherols in hydrogenated vegetable oil, and (C) a 0.05 to 0.80 percent gossypol solution in Wesson oil.

The experiments showed that storage of sliced bacon in the dark, at room temperatures, reduced the onset of rancidity. Smoking approximatedly doubled the keeping time. Unsmoked bacon, treated with antioxidants A, B and the higher values of C kept four or five times as long as untreated bacon. Smoked bacon, treated with antioxidant, kept five times as long as the untreated, sometimes longer.

Digest from "Rancidity of Bacon, Effect of Antioxidants," by F. H. Smith, D. E. Brady, and R. F. Comstock, *Industrial and Engineering Chemistry*, vol. 37, 1206-9, December, 1945.

DAIRY

Dry Milk for Ice Cream

DRY MILK of high viscosity, especially adapted for making ice cream, is described in a recent patent. Milk (usually skimmed) is preheated to around 170 deg. F. and condensed in vacuum to 35 to 45 percent total solids. The concentrate is superheated, with direct steam or otherwise, to 180 to 210 deg. F., or even higher, until the milk not only curdles but the curd becomes tough and whey tends to separate. The curds and whey are then smoothed out and dried, normally by the spray process.

When reconstituted, this powder produced skim milk with viscosity 4 to 8 times as great as that produced from regular skim milk powder. The powder has greater water absorbing power.

It is claimed that when used to make ice cream, it improves the whipping quality, emulsifies better, permitting the egg yolk content to be decreased, and allows not less than 25 percent reduction in stabilizer. Ice cream made with this powder can be drawn from the freezer 1 deg. F. higher than normal and stands up better in cabinet storage, under conditions of variable temperature.

The powder is denser than the regular type, so that 230 to 240 lb. can be packed in a barrel instead of the usual 200 lb.

Digest of U. S. Patent 2,383,070 issued August 21, 1945, on an application dated July 31, 1940, to D. E. Mook, and assigned to The Borden Co., New York.

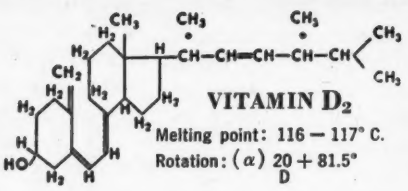
Volumetric Moisture In Dairy Products

ONLY a few minutes are required for a determination of moisture in some dairy products, by a method which is based on that of Karl Fischer. It is satisfactory for butter oil, butter, dry milk solids and sweetened-condensed milk. It is not satisfac-

Winthrop ANNOUNCES New Low Prices on—

PURE CRYSTALLINE Vitamin D_2

★ (CALCIFEROL)



Write For Details and New Price Schedule

Winthrop's synthetic vitamin D_2 (Calciferol) is free from lumisterol, toxisterol, suprasterol, and other by-products of irradiation. It never varies in antirachitic potency.

OTHER WINTHROP PURE SYNTHETIC VITAMINS:

- **TRIDEE**—Winthrop's Brand of vitamin D_3 in Corn Oil
- **VITAMIN B_1** (Thiamine Hydrochloride)
- **VITAMIN B_2** (Riboflavin)
- **NIACINAMIDE**
- **VITAMIN B_6** (Pyridoxine Hydrochloride)
- **CALCIUM PANTOTHENATE**
- **VITAMIN C** (Ascorbic Acid)
- **d-ISO-ASCORBIC ACID...**
- **AMINO-ACIDS**

Valine	Glutamic Acid
Cystine	Tryptophane
Tyrosine	Phenylalanine
Leucine	Methionine

- **"B-E-T-S"**—Winthrop's Brand of Bread-Enrichment Tablets
- **"VEXTRAM"**—Winthrop's Brand of Flour-Enrichment Mixture

POTENCIES AND PACKINGS:

Crystalline Form in vials of one, five, and ten grams.

Solution in Corn Oil: 1,000,000 U.S.P. Units per gram* packed as follows:

400 Standard Units — 2,500 Standard Units
1,000 Standard Units — 50,000 Standard Units

Also Solution in Corn Oil: 400,000 U.S.P. Units per gram packed as follows:

250 Standard Units — 1,000 Standard Units
500 Standard Units — 20,000 Standard Units

*Standard Unit=1,000,000 U. S. P. Units

WINTHROP

For prices and information address
Special Markets Division
WINTHROP CHEMICAL COMPANY, INC.
170 Varick Street, New York 13, N. Y.
★ Sole Manufacturer under U.S. Patent 1,902,785 granted to Winthrop Chemical Company, Inc.

tory for evaporated milk, skim-condensed milk or whole milk.

A sample containing about 100 milligram of water is weighed directly into a 100 ml. beaker, 20 ml. of absolute methanol is added and the sample is placed immediately in the titration assembly. Either direct titration with the Karl Fischer reagent or back-titration with a standard solution of water in methanol against an excess of Karl Fischer reagent will give results sufficiently reproducible for routine analysis. The endpoint is determined with a Beckman pH meter using the glass electrode as reference and platinum wire as the indicating electrode.

On one series of dry milk solids, back-titration yielded results 0.12 to 0.19 percent higher than those by toluol distillation. Direct titrations were 0.3 percent lower to 0.08 percent higher. On another series of 26 samples of dry milk solids, the back titration method ranged from 0.13 percent lower to 0.34 percent higher, averaging 0.076 percent higher than the toluol method.

Because of its instability, the reagent must be standardized just before use. Reagent cost for a single analysis is about 20 cents but the rapidity of the method justifies the cost.

Digest from "Volumetric Determination of Moisture in Dairy Products," by B. Heinemann, *Journal of Dairy Science*, vol. 28, 845-51, November, 1945.

ENGINEERING

Ferric Sulphate For Sewage Disposal

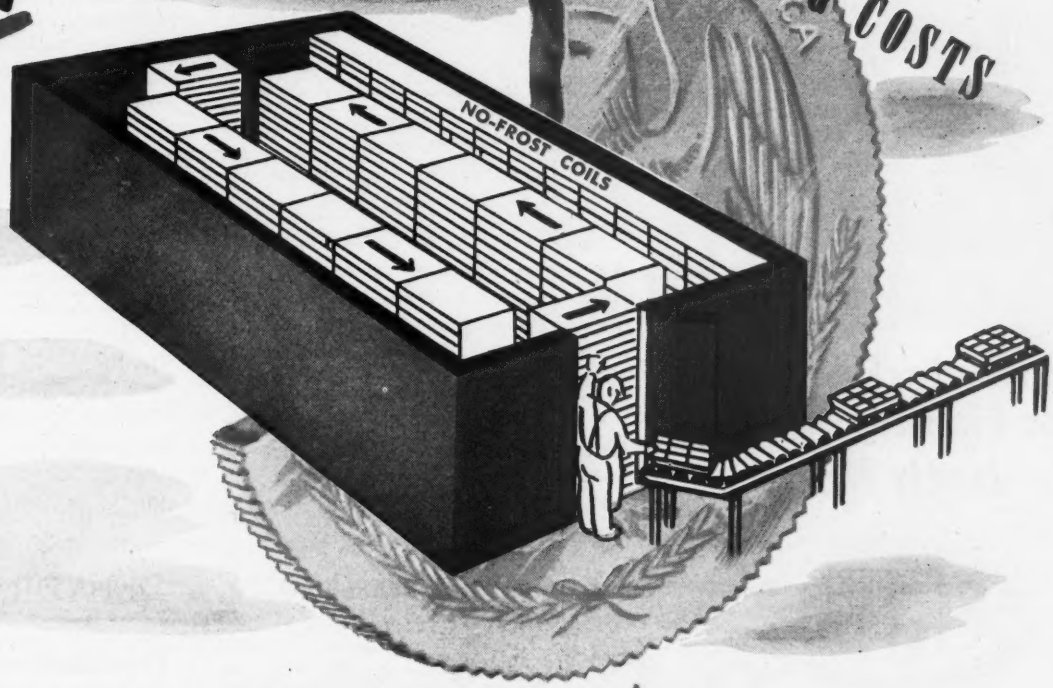
FERRIC SULPHATE, used to augment plain flocculation of suspended solids in sewage disposal plants, may have an application in the treatment of cannery or other food plant wastes.

Production of ferric sulphate at low cost by the "autoxidation" process, using scrap iron and commercial sulphur, as carried out at the sewage treatment plant in Phoenix, Ariz., is described.

The process involves: (1) oxidation of ferrous sulphate by a sulphur dioxide conversion cell, using finely divided air, (2) recirculating a portion of this solution over scrap iron to reduce the ferric back to ferrous iron and increase the total iron content, (3) making up the reduced solution with water to original volume and returning to oxidation cell.

Advantages claimed for the process are: (1) production of either ferric or ferrous sulphate solution at concentrations up to 50 g. Fe per liter, with free acid held at any de-

Slash YOUR FREEZING AND HANDLING COSTS



NON-STOP PRODUCTION

★ If you are like other producers of frozen foods, the cost of handling and freezing operations after packaging is taxing your wits. You, too, want to fit freezing into your otherwise high production lines . . . and . . . here is how it can be done mechanically.

The Salem "Automatic" Commercial Freezing Plant comprises a conveyor system and a freezing chamber. Food moves from the packaging machine to the chamber — no one enters the chamber . . . operations are non-stop.

Salem "Automatic" commercial freezer is a patented, engineered project from beginning to end. *Speed, less handling, lower labor costs, lower power costs, lower maintenance costs, and dependable freezing* are literally engineered into these jobs.

Salem freezes for less-

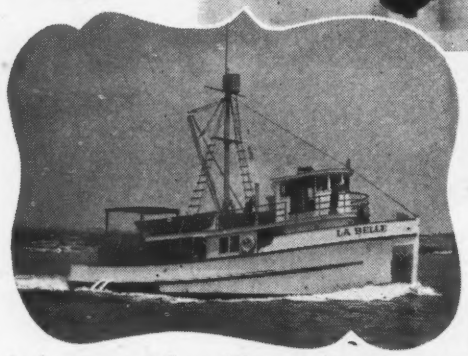
also...Locker Plants

Salem "Automatic" food storage locker plant patrons do not enter the refrigerated chamber. They merely push a button and lockers come to a door of the refrigeration room. There, without delay, and in comfort, locker customers have access to their lockers. This is the most profitable locker plant setup you can have. Write today for literature.

SALEM
ENGINEERING CONTRACT
★ SALEM, OHIO
★ TORONTO, ONTARIO
★ LONDON, ENGLAND

Frick Air Conditioning Helped to Build the Martin Marauder

The Tuna Fisher "La Belle" Carries 2 Frick Refrigerating Machines



Whether for making machines of war or keeping fresh the catch of a peaceful fishing boat, you'll find Frick refrigerating, ice making, or air conditioning equipment the answer to any cooling need.

Proud of the part we played in providing vital cooling equipment for the Army and Navy, and for munitions plants, we are now continuing production, without interruption, on a backlog of orders already placed by customers.

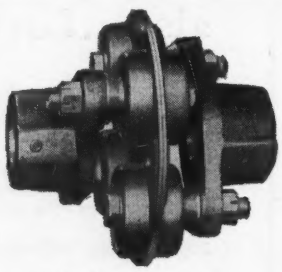
If you need dependable cooling service for commercial or industrial purposes, get in touch with the nearest Frick Branch or distributor. They're in principal cities everywhere.

Marauder Bombers or Fishing Boats —both Need

TRADE FRICK MARK

Refrigeration

Frick Company, Waynesboro, Pa.



A clean coupling

MORFLEX

requires no lubrication!

Specially designed rubber trunnion biscuits eliminate all metal-on-metal contact, make lubrication unnecessary. No oil or grease to throw off and soil or spoil products. Morflex absorbs shock, isolates vibration, smooths machine operation. Sized from 2" to 12" diameter for various capacities.

MORSE CHAIN CO. • Detroit 8, Mich. • Ithaca, N.Y.

A Borg-Warner Industry

MORSE COUPLINGS and DRIVE SHAFTS

sired concentration, (2) practically complete conversion of SO_2 gas to sulphate, eliminating objectionable odors, (3) simplified plant operation to minimize supervision and laboratory control, (4) low cost of installation and maintenance, (5) reasonably fool-proof mechanical operation.

Computed costs, based on the use of 6,000 lb. of $Fe_2(SO_4)_3$ per 24 hours, or dosage of 1 grain ferric Fe per gal., for 12 million gallon flow:

Labor—3 shifts at $5.00	$15.00
Sulphur—1,470 lb. at $0.01155	16.90
Scrap Iron—1,678 lb. at $6.50 per ton	5.55
Power—421 kwh. at $0.007	2.95
Cost per day	$40.40
Cost per pound of:	
contained iron, as Fe	$0.0241
ferric sulphate, $Fe_2(SO_4)_3$	$0.00674

The total cost of the plant for producing 2,000 lb. of ferric sulphate per day, including equipment and erection, as constructed in 1939, was approximately $2,500.

Digest from "The Autoxidation Process," by H. E. Keyes and D. Travaini, *Water Works and Sewerage*, August, 1945.

DEHYDRATION

Troublesome Reactions In Dried Eggs

REACTION between sugars and the amino groups of food proteins is one possible cause of darkening of food products after processing. It has been observed in condensed milk, but fruit products and dried eggs undergo similar changes, which account in part for their discoloration in storage.

Fluorescence in dried eggs, long used as an index of palatability, arises from a brown material produced by an aldehyde amine reaction. In a mixture of dried crystalline egg albumin and 5 percent of dry glucose, brought to 11 percent moisture, storage at 122 deg. F. caused browning in six days. Controls without glucose were colorless. The amino nitrogen of the sample containing glucose was about half that of the control sample and the fluorescence about 18 times as much.

Egg albumin, egg white globulin, livetin, lipovitellin and casein gave similar results, indicating that no one egg protein constituent is responsible for the reaction.

Fluorescence does not develop in pepsin-digested egg albumin.

It is known that simple amino acids such as glycine react with glucose to give brown colors, but only if moisture is present. Glucosides of amyl, butyl and ethanol amines also yield dark brown sirups, on long standing at room temperature and

(*Turn to page* 198)

for the mother good health for the child!

In 1944, there were 2,800,000 babies born in the United States.

How many of the mothers of these babies received proper nutrition during their months of pregnancy?

This question is pertinent, in the light of recent studies in maternal and infant nutrition.

These studies, made at Harvard University, have shown "a statistically significant relationship between diet of the mother during pregnancy and the condition of the infant at birth."

Reporting on these studies, the Nutrition Foundation has this to say:

"It appears that the prospect of an infant's being in robust health is four times greater when the mother's diet has been good, compared to the result when maternal diets have been poor or very poor."

Now, it is reasonable to say that *a good many of today's expectant mothers are not getting proper diets.*

What can be done to alleviate this situation? More education about proper maternal diets. More vitamin-fortified foods. More expectant mothers *automatically* getting better diets.

Your company undoubtedly has plans under way for further enrichment of foods, to contribute better diets for *all* Americans.

Standard Brands Incorporated has spent much time and research in recent years, developing more yeast products for Vitamin B complex and Vitamin D food fortification. These products are known for their dependability and uniformity.

If you are now seeking ways of enriching your company's products, we invite you to discuss your needs in confidence with one of our executives.

Products containing
VITAMIN D

Fleischmann's Hy-Dee
Irradiated Dry Yeast

Fleischmann's Irradiated Dry Yeast
Type 700-H

Standard Brands Viosterol
(Activated Ergosterol) Steenbock Process

Products containing
NATURAL B COMPLEX FACTORS

Fleischmann's
Pure Dry Primary Yeasts *(Brewer's Strain)*

Fleischmann's
Bee-Flex Products

Fleischmann's
Brewer's Yeast Extract Types 3 and 41

Fleischmann's
Yeast Extract and Liver

STANDARD BRANDS INCORPORATED

Pharmaceutical Division . . . 595 Madison Avenue . . . New York 22, N. Y.

PREVENT

Rust · Scale · Dirt

FROM CLOGGING
STEAM EQUIPMENT

YARWAY

STRAINERS

"The Screen's the Thing"

- *A High Grade Monel Woven Wire Basket* with mesh fine enough to catch the dirt—yet ample free area for passage of clean condensate, oil and other fluids.
- *Body Cadmium Plated Inside and Out for Protection Against Corrosion.*
- *Readily Removed Steel Blow-Off Bushing.*
- *Bushing Automatically Aligns Screen.*
- *Thousands in Use—Sold by Over 100 Mill Supply Houses.*
- *6 Sizes ½" to 2" for Pressures up to 600 Lbs.*

See Your Supply House or write for Bulletin S-200

YARNALL-WARING COMPANY

127 MERMAID AVENUE PHILADELPHIA 18, PA.

YARWAY STRAINERS

rapidly at 122 deg. F. These solutions are highly fluorescent, fluorescence development progressing at a rate parallel to the development of color.

Besides the simpler amine-glucose reactions, the phospholipides of eggs also react with aldehyde to give brown colors. Reaction is very rapid between cephalin and acetaldehyde, but less rapid with lecithin. The common failure to find aldehydes in egg fat may be due to their combination with the lipide amines.

In stored dried eggs, color changes that take place are the resultant effect of three oxidative chemical changes—destruction of carotenoid pigments, production of yellow-to-brown materials by polymerization of unsaturated fatty acid groups and development of brown products by amine-aldehyde reactions among the lipide groups.

Spectrometric and fluorometric studies were made on spray-dried egg powders, stored in paper-lined barrels at 98, 70, and 15 deg. F., for periods of 1 to 9 months. Little change was found at 15 deg. F. With increasing storage temperature, decrease of the absorption spectra of the total extracted lipides in the visible region indicates loss of the carotenoids, which have absorption maxima in that region. Conjugation of fatty acid double bonds and formation of lipide amine-aldehyde condensation products account for the increase in the ultraviolet.

Curves of the change in the absorption of the unsaponifiable fraction at 445 millimicrons show accelerated decreases in absorption over the 9-month storage period at 70 and 98 deg. F. Similar curves for the acid ether extract (fatty acid fraction) and for the acid aqueous solution (amino-aldehyde products) at 270 millimicrons show marked increases in absorption with time at the higher temperatures.

Fluorescence coefficient changes were absent at 15 deg. F. but pronounced at 70 and 98 deg. F. during the storage period. No fluorescing material was found in the unsaponifiable matter or the acid ether fractions. Changes in the total lipide extract and in the acid-aqueous fraction indicated that the fluorescent material is released from the lipide combination by saponification. This and other evidence points to the fluorescence as due to the lipide amino-aldehyde products.

Results, not yet published, indicate that concentration of lipide amino-aldehyde reaction products is correlated with palatability changes of both high-moisture and low-moisture eggs, the former having over 5

WOMEN VOTE 2 to 1 FOR COFFEE PACKED IN GLASS!

Coffee packed in glass wins an overwhelming consumer preference!

The emphatic 2 to 1 vote for this modern package was established in a nation-wide survey of food container preferences made by a noted public opinion analyst.*

Here are some of the reasons these homemakers gave for wanting their coffee glass-packed:

PROTECTION

Coffee packed in glass can be stored in original container. Easy-to-open . . . easy-to-reseal. Keeps out flavor-killing air.

VISIBILITY

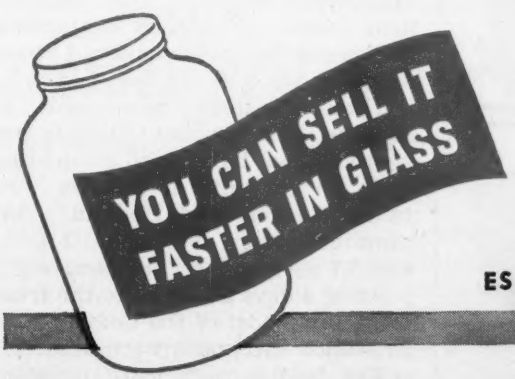
They see what they are buying, the grind they prefer. Glass tells homemaker when to buy more.

CONVENIENCE

Coffee keeps fresher in glass . . . flavor and aroma stay at delicious strength. Vacuum cap reseals between uses.

PREFERENCE

Of women expressing a preference, twice as many chose glass as next most popular container mentioned!



A Duraglas coffee container has important Duraglas technique advantages—light weight, strength, compactness. No wonder that so many retailers say: "Glass-packed products require less *selling* time."

**Name supplied upon request.*

ESPECIALLY IN Duraglas CONTAINERS

TRADE MARK REG. U.S. PAT. OFF.

OWENS-ILLINOIS GLASS COMPANY · TOLEDO 1, OHIO · *Branches in Principal Cities*

keep quality HIGH . . .

and bacteria count LOW with

LO-BAX*

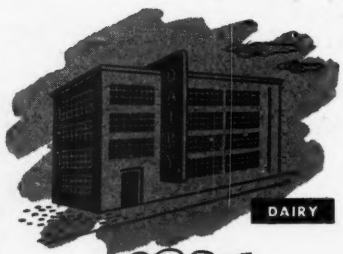
Bacteria are always lying in wait . . . ready to contaminate foodstuffs and affect product purity unless all plant equipment is kept scrupulously clean and sanitary.

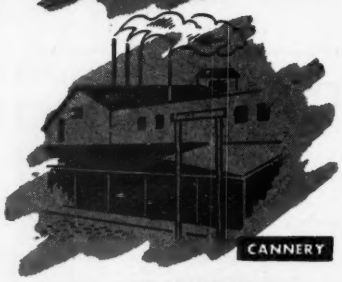
Lo-Bax, the concentrated, fast-killing chlorine bactericide helps prevent food spoilage, improves quality standards by rigidly controlling bacteria, keeping down mold and sanitizing all surfaces with which food or beverages come in contact.

Simple and easy to handle—Lo-Bax kills bacteria almost instantly on contact . . . and at amazingly low cost. Dissolves quickly in water—hot or cold, hard or soft—to make clear chlorine-rinse solutions. Lo-Bax, with its 50% available chlorine, is dependable—retains its strength as packed in original container.

Let Lo-Bax help you maintain high quality standards. Write for free information on the many uses of this fast-killing bactericide.

THE MATHIESON ALKALI WORKS (INC.)
60 East 42nd Street, New York 17, N. Y.





*LO-BAX
50% AVAILABLE CHLORINE

LO-BAX SPECIAL—a superior chlorine bactericide in granular form—packed in 2½-lb. bottles, ½ doz. to the case; and in 14-oz. bottles, 1 doz. to the case.

LO-BAX POWDER—a highly efficient chlorine bactericide packed in 1¾-lb. bottles, 1 doz. to the case.

Mathieson
LO-BAX
CHLORINE BACTERICIDE

Lo-Bax • Super-Nufos • HTH-15 • Dry Ice • Carbonic Gas • Ammonia, Anhydrous & Aqua • Caustic Soda • Soda Ash • Bicarbonate of Soda • Liquid Chlorine • Chlorine Dioxide • PH-Plus • Synthetic Salt Cake • Sodium Chlorite Products • Sodium Methylate

percent and the latter less than 1 percent moisture.

Digest from "Changes in Stored Dried Eggs: Source of Fluorescence," by H. S. Olcott and H. J. Dutton: "Role of Phospholipides and Aldehydes in Discoloration," by B. G. Edwards and Dutton; and "Spectrophotometric and Fluorometric Measurement of Changes in Lipides," by Dutton and Edwards. *Industrial and Engineering Chemistry*, vol. 37, 1119-21, 1121-22 and 1123-26. November, 1945.

SANITATION

Inhibitors of Sulphate Reducing Bacteria

DYESTUFFS as inhibitors of sulphate reducing bacteria are disclosed in a recent British patent. Water containing 120 p.p.m. of sulphates was used for washing wheat in a flour mill. The wheat contributed bacteria and organic nutrients. Hydrogen sulphide evolved, produced serious corrosion in metal equipment, and annoyance to workers. Chlorination of the water was tried, but the concentration, 28 p.p.m., required, also produced corrosion.

A flavin dye, known as No. 914, made by Imperial Chemical Industries, Ltd., was found to be effective in eliminating the bacteria. Feed tank, washing tank and wheat washer were thoroughly cleaned and flooded with dye solution at 4 to 8 p.p.m. After 48 hrs. the solution was drained off and normal milling begun. Treatment was made weekly, with a 16 p.p.m. treatment every 4 weeks. The entire system was free of contamination after 12 weeks.

Digest of "Treatment of Sulphate-Reducing Bacteria in a Flour Mill," by E. C. Barton-Wright, *Journal of the Society of Chemical Industry*, vol. 64, 295, October, 1945.

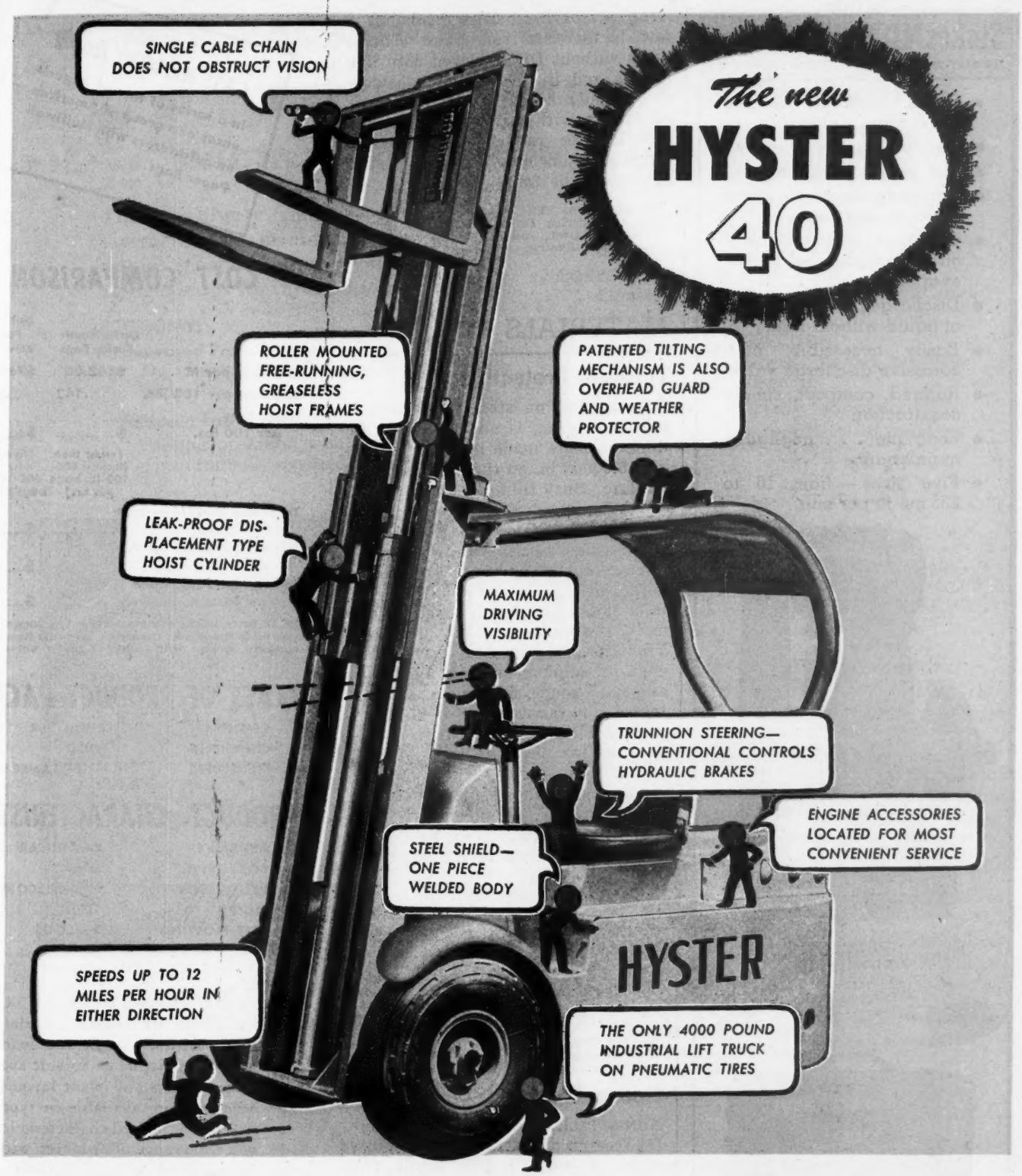
STORAGE

Insect Control

DDT TREATED SACKING, as a control measure against insects that infest stored cereal products, has been used successfully in the United Kingdom. The test insects were: the rice beetle (*Calandra oryzae*), the confused flour beetle (*Tribolium confusum*), and one of the spider beetles (*Ptinus tectus*).

Three solutions were used: an aqueous DDT emulsion; DDT in turpentine, and DDT with coumarone resin in turpentine. Fabrics were twilled sacking and Hessian. They contained after treatment, 1.6, 0.5 and 0.7 percent DDT, respectively.

After 4 days exposure to the treated sacking most of the *Calandra* and *Tribolium* specimens were dead. The spider beetles were more resistant. After a week many were still alive.


SINGLE CABLE CHAIN DOES NOT OBSTRUCT VISION
The new HYSTER 40
ROLLER MOUNTED FREE-RUNNING, GREASELESS HOIST FRAMES
PATENTED TILTING MECHANISM IS ALSO OVERHEAD GUARD AND WEATHER PROTECTOR
LEAK-PROOF DISPLACEMENT TYPE HOIST CYLINDER
MAXIMUM DRIVING VISIBILITY
TRUNNION STEERING— CONVENTIONAL CONTROLS HYDRAULIC BRAKES
ENGINE ACCESSORIES LOCATED FOR MOST CONVENIENT SERVICE
STEEL SHIELD— ONE PIECE WELDED BODY
HYSTER
SPEEDS UP TO 12 MILES PER HOUR IN EITHER DIRECTION
THE ONLY 4000 POUND INDUSTRIAL LIFT TRUCK ON PNEUMATIC TIRES

ANOTHER NEW HYSTER PROFIT-MAKER FOR YOUR BUSINESS!

A 4000-pound Industrial Lift Truck on pneumatic tires!

The new Hyster "40", with 2-ton lifting, transporting, stacking capacity *has the ability to solve 7 out of every 10* materials handling problems in the average business... Pneumatic tires for fast, smooth work, indoors and outdoors. Gasoline powered. Powerful, efficient hydraulic lifting mechanism. Many new engineering improvements. Easy to operate. Easy to service.

The new Hyster "40" is fully illustrated and described in Bulletin 1016. Write for your copy.

DISTRIBUTOR SALES AND SERVICE IN PRINCIPAL CITIES

HYSTER COMPANY

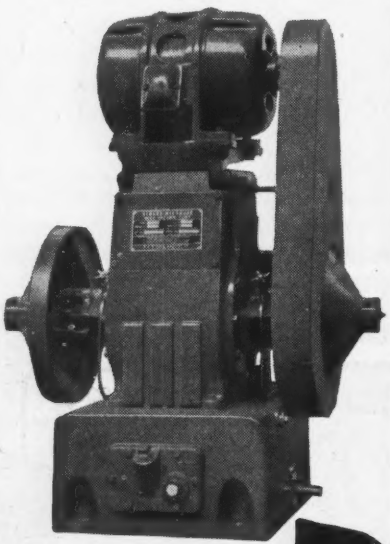
2902-35 N. E. Clackamas, Portland 8, Oregon
1802-35 North Adams St., Peoria 1, Illinois

BRANCH OFFICES:
CHICAGO • NEW YORK • MEMPHIS • SEATTLE
SAN FRANCISCO • LOS ANGELES

HYSTER

Stokes MICROVAC Pumps
HEART OF HIGH VACUUM SYSTEMS

- Higher Vacuum (in the low micron range)
- High volumetric efficiency
- Low power requirement
- Complete discharge of air — no re-expansion
- Continuous dehydration of oil — no moisture to re-evaporate
- Discharges sudden slugs of liquid without injury
- Easily accessible, non-corrosive discharge valve
- Rugged, compact, simple construction
- Long life . . . negligible maintenance
- Five sizes — from 10 to 235 cu. ft. per min.



Stokes VACUUM GAUGES
(Patented McLeod Type)
Are Always Accurate

- Require no calibration
- Rapid readings
- Simple to operate — just tip and read
- Two models — (AA) — 0 to 5000 microns (BB) — 0 to 700 microns, with readings to 1/10 micron.

F. J. STOKES MACHINE CO.
5976 Tabor Road Phila. 20, Pa.

Stokes High Vacuum
PUMPS • GAUGES • EQUIPMENT

After a month all were dead, but a few larvae survived. The control sacks without DDT showed both live insects and live larvae in considerable numbers. Control of this species of *Ptinus* with DDT is effected by reducing its rate of reproduction, although sufficiently long exposure appears to be fatal.

Digest from "The Action on Certain Insects of Fabrics Impregnated with DDT," by H. Hayhurst, *Journal of the Society of Chemical Industry*, vol. 64, 296, October, 1945.

MATERIALS

Tinplate Protection

TIN COATING on steel, to protect it from corrosion, is about 0.00008 in. thick on plate made by dipping, and only 0.00003 in. on the newer electrotinplate. Such thin coatings are broken by minute pores that give rise to corrosion problems.

Corrosion resistance of tinplate to the atmosphere and to non-acid foods is improved by immersion for 20 sec. in a hot solution of alkaline chromate, containing a little phosphate. Tinplates, thus treated, is not blackened by sulphur bearing foods such as meats, soups, fish or certain vegetables, and the exterior of the can is remarkably resistant to rusting. The deformation incident to can fabricating does not destroy the film. Tin absorption by foods is less than from untreated cans. An incidental advantage is that labels stick to the film more readily than to untreated tinplate.

External treatment can also be given to the cans after filling.

Digest from "Developments in Tin and Tin Alloy Coatings," by E. S. Hedges, *Chemistry and Industry*, pp. 370-73, December 1, 1945.

MISCELLANEOUS

Cocoa Extraction

NON-SETTLING soluble, practically fat-free cocoa extract and increased yield of cocoa butter result from a series-extraction treatment described in a recent patent.

Water at a relatively high temperature solubilizes the starch of the nibs. It extracts acids, alkaloids, tannins and flavoring materials. Further, above 266 deg. F. it partially hydrolyzes the hemicelluloses, increasing the yield.

In the patented system, coarsely ground cocoa nibs, not less than 0.12 in. in diameter, are packed closely but without pressure in two extraction cells 15 ft. high, arranged in

CASE HISTORY No. 2
In a series of factual experiences of a group of American manufacturers with Multiwall Paper Bags.

COST COMPARISON

	Open-Mouth Burlap Bags	Multiwall Paper Valve Bags
Bag Cost per M	$142.00	$76.00
Bag Cost per 100 lbs.	.142	.076
Labor Cost per 100 lbs.	$_____ (eight men packed 500 100-lb. bags per hr.)	$_____ (five men now pack 600 100-lb. bags per hr.)
Total Bag and Labor Cost per 100 lbs.	$_____	$_____
Saving per Bag, Paper over Burlap		$_____
Saving per Ton, Paper over Burlap		$_____

NOTE to fertilizer manufacturers: We suggest that you fill in the blanks from your own cost figures and compute savings with multiwall paper valve bags.

CLASS OF PRODUCT PACKED

CEMENT	FERTILIZER ✓
CHEMICALS	FOOD
FEEDSTUFFS	MISCELLANEOUS

PRODUCT CHARACTERISTICS

ABRASIVE	GRANULAR ✓
CORROSIVE	HEAVY
DELIQUESCENT	HYGROSCOPIC ✓
FLUFFY	LIGHT
FREE-FLOWING	VISCOUS

ST. REGIS BAG PACKAGING SYSTEMS are made in a variety of capacities, speeds, and manpower requirements to suit specific products and plant layouts. Machines are available in types to meet the special characteristics of a wide range of products, with filling speeds as high as twenty-four 100-lb. bags per minute — with one operator.

LOWER PACKAGING COSTS...

BETTER PRODUCT PROTECTION—

another MULTIWALL *success story*

This case history relates the experience of several fertilizer manufacturers who are enthusiastic about St. Regis Valve Bag Packaging systems for three important reasons:

ECONOMY:

Increased Production:
Daily average 20% higher with St. Regis packer.

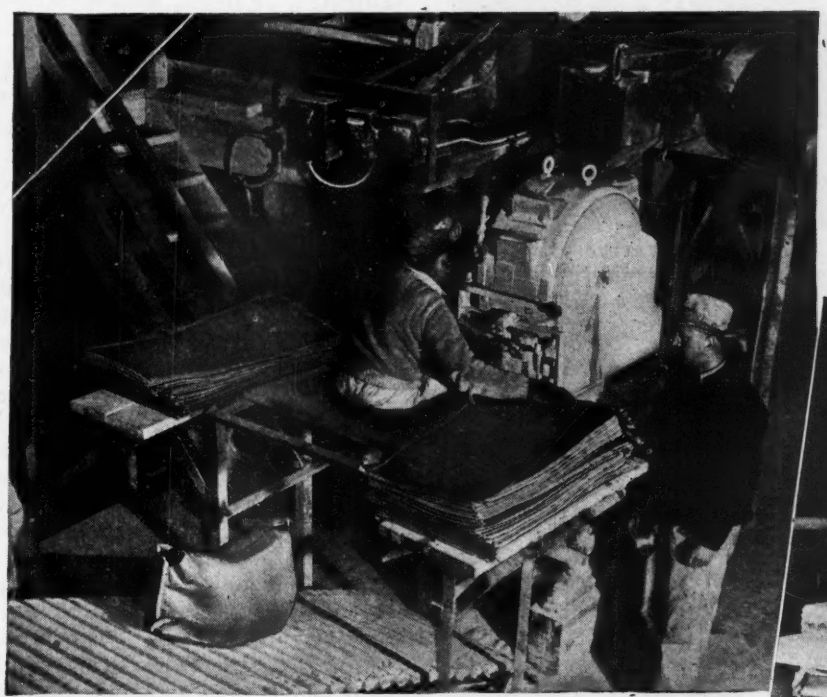
Reduced Labor Costs:
Packing operation with 5 men, instead of 8 men formerly required.

Reduced Container Costs:
Multiwalls approximately 50% of cost of burlap bags.

CORRECT WEIGHTS:
Eliminates customer complaints about siftage and retention losses.

BETTER PRODUCT PROTECTION:
Custom-built multiwalls protect products from damaging dampness.

Multiwalls are specially constructed to handle and protect fertilizer of various analyses.



(At left) This high-speed St. Regis Packer fills Multiwall Paper Valve Bags and weighs them simultaneously.

(Below) Illustrating the quick, easy handling of Multiwall Paper Bags.

St. Regis MULTIWALL PAPER BAGS

ST. REGIS PAPER COMPANY
TAGGART CORPORATION

NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
BALTIMORE 2: 2601 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St.

Mail this coupon for the complete story

Without obligation, please send me full details regarding the "Case History" outlined above.

NAME_____

COMPANY_____

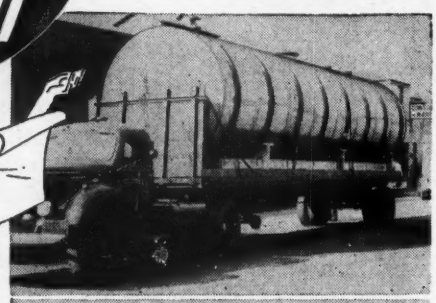
ADDRESS_____

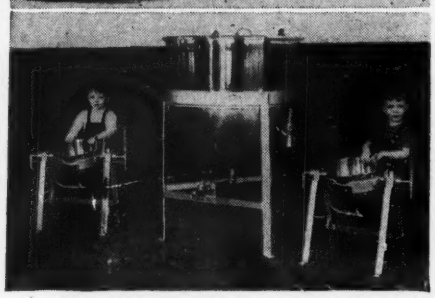
Birmingham Boston Cleveland Dallas Denver
Detroit Franklin, Va. Los Angeles Nazareth, Pa.
New Orleans No. Kansas City, Mo. Seattle Toledo

IN CANADA: St. Regis Paper Co. (Can.) Ltd., Montreal, Vancouver.

LEE
DESIGNS AND BUILDS

- JACKETED KETTLES
- "NOCOIL" JUICE AND BRINE TANKS
- PULP AND STORAGE TANKS
- JACKETED TANKS
- AGITATORS AND AGITATOR KETTLES
- FLUSH TYPE VALVES
- VACUUM PANS
- SPECIAL EQUIPMENT TO CUSTOMER'S SPECIFICATION—FROM STAINLESS STEEL





Lee is now in position to make reasonable deliveries on your most urgently needed stainless steel kettles. All Lee kettles are made to A.S.M.E. Code and certificates furnished with each job.

Let LEE ENGINEERS Work with you NOW!

LEE METAL PRODUCTS COMPANY, INC.
415 PINE ST. PHILIPSBURG, PA.

FOR PLANT MAINTENANCE AND PROTECTION
"Buffalo" DIAMOND MESH FABRIC
VERSATILE·ECONOMICAL·SAFE·ATTRACTIVE
The same Diamond Mesh Fabric used for fabricating "Buffalo Wire" guards, partitions, grilles and panels, is also furnished to hundreds of plants in ROLLS OR CUT PIECES for numerous purposes.
• Any standard width is adaptable to any near width without waste.
• After installed on a frame, mesh is rigid and permanent.
• Smooth wires for safety.
• Deep crimped-uniform.
• Requires no painting or rust-proofing. Woven from galvanized wire (at no extra cost).
• Mesh sizes for every use.
Folder 602-BC tells how to measure, how to specify, types of installations. FREE ON REQUEST.
MANUFACTURERS OF ALL KINDS OF WIRE CLOTH FOR 75 YEARS
Buffalo WIRE WORKS CO., INC.
ESTABLISHED 1869 AS SCHEELER'S SONS

452 TERRACE BUFFALO 2, N. Y.

series. Water, initially at temperatures up to 355 deg. F., passes up through the first cell, leaving it at 300 deg. F. or less, then upward through the second cell, entering at about 212 and leaving at about 176 deg. F. Enough is used to give 1 lb. of extract containing 15 percent dissolved solids for each pound of nibs used.

Cocoa butter is expressed from the spent nibs after they are dried and ground to a paste.: Yield is 49¼ percent, compared to 47 percent for untreated nibs. The slightly acid (pH 5.3) extract from the nibs is centrifugally clarified, then potassium carbonate is added to about pH 8.2. Boiling for two hours in an open kettle develops the cocoa-red color and the true cocoa flavor. The extract is finally neutralized with tartaric acid to pH 6.8.

It can be used as is, further concentrated, or dried, with or without the addition of milk or sugar.

Digest of U. S. Patent 2,380,158, issued July 10, 1945, on an application dated October 21, 1942, to H. K. Durrenmatt and J. de Schoulepnikow, and assigned to Inredeco, Inc. (a subsidiary of Nestle's Anglo Swiss Milk Co.).

Gelatin Extraction

LIME soaking of gelatin stocks reduces the heating time for extraction. Changes due to soaking include liberation of ammonia from the collagens and changes in the amino acid constitution of the gelatin produced from them. Hydrolysis of peptide linkages with release of carboxyl and amino groups takes place, but on such a small scale that it is doubtful if it is responsible for the increased facility of extraction.

Dried ox sinews were washed, soaked in water with an excess of lime at 70 deg. F. for periods up to 43 days, washed successively in acidified and tap water, then extracted at 176 deg. F. for a time sufficient to insure a jelly strong enough to dry.

Heating time to obtain 50 to 60 percent of the stock in the form of gelatin was reduced from 15 to 3 hours.

The isoelectric point of the gelatin shifted from pH 5.46 to 4.84 in 10 days, but an additional 29 days were required to reach pH 4.75. The Bloom gel strength rose gradually for 29 days, then fell off. Viscosity measurements were irregular. The yield was essentially constant for all soaking periods. Formol titration changes, while definite, were too small for gelatin evaluation.

Digest from "Hydrolysis of Peptide Linkages in the Preparation of Gelatin," by W. M. Ames, *Journal of the Society of Chemical Industry*, vol. 64, 242-3, September, 1945.

BOOKS

Butter Making

PRACTICAL BUTTER MANUFACTURE; 4th Edition. By G. H. Wilster. Published by Oregon State College Cooperative Assn., Corvallis, Ore., 1944. 6½x9 in.; 266 pages; paper. Price, $3.00, plus postage.

Inclusion of reference data adds value to this complete revision of previous editions and makes it more than a manual for butter makers. Colleges and universities giving courses in dairy products manufacture will find its contents of textbook value.

As in its earlier editions, the contents of this manual are organized primarily to supply essential information in a practical and easily understood manner on procedures and practices in the making, handling and packaging of butter. In addition, it deals with the milk and cream, equipment, water, and supplies used in butter making. Further, the defects and undesired properties of butter are discussed so that they may be recognized and understood as well as avoided or prevented, at least to a large extent.

Its contents make it of value to young butter makers who want to advance in their trade and to those who are preparing for an examination to obtain a state license.

Considerable emphasis is placed on plant sanitation and sanitary practices in respect to equipment and cream and butter handling. In the main, the question and answer method of imparting information is followed. The effects of various factors on overrun are shown by calculation data.

Mechanically, the manual is a handy tool in that its loose plastic binding permits it to open flat and its contents to be read while the operator's hands are otherwise engaged.

Although the book carries a 1944 publication date, it did not become available until the butter making season of 1945.

Farm Problems

AGRICULTURE IN AN UNSTABLE ECONOMY. By Theodore W. Schultz. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y., 1945. 6x9 in.; 299 pages; cloth. Price, $2.75.

The ages-old farm problem of unequal supply and demand are brought up to date in this study. It shows how the war's impact has aggravated the problem, but holds out hope that a workable solution may be found.

The book is one of the results of the research studies made by the Committee for Economic Development and discusses some of the basic problems within agriculture as well as the maladjustments between agriculture and the rest of the nation's economy. The human factors—often overlooked in economic studies—are never overlooked in this one, but are carefully considered when policies are suggested.

The book makes no pretense at answering all of the agricultural questions, but it does present the whole picture in colors that seem true.

Wartime Subsidies

EXPERIENCE WITH WARTIME SUBSIDIES. By Jules Backman. Published by Citizens National Committee, Inc., 2633 16th St., Washington 9, D. C., 1945. 6x8½ in.; 50 pages; paper. Free.

While subsidies gained wide usage during the war, they are, by no means, solely a wartime practice. In fact, the author maintains that the real subsidy problem is yet to come. Shall they be continued or shall they be eliminated after they have served their wartime purpose?

The analysis of wartime subsidies, as presented in this monograph, gives an intelligent and informative picture of the question.

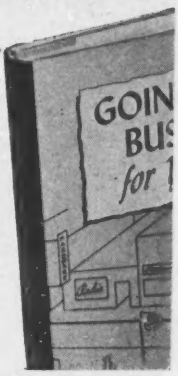
Food Chemicals

CHEMICALS AND FOOD PRODUCTION. By Philip H. Groggins, from The Nineteenth Annual Priestley Lectures, May, 1945. Available from Professor Robert W. Schiessler, The Pennsylvania State College, State College, Pennsylvania. 8¼x10¾ in.; 115 pages, lithoprinted, paper cover. Price, $2.00. (Make checks or money orders payable to Phi Lambda Upsilon).

This summary of information on chemicals utilization in food and agriculture is presented by the former head of the chemicals division of the War Food Administration. The content is both historical and technical with a wealth of statistical material. Although the book has no index, it is arranged in a very logical manner and should serve as a useful reference volume for many years.

There are three sections in the book, the first dealing with fertilizer chemicals, the second with insecticides and fungicides for crop and animal protection, and the third with chemicals for processing, preserving,

How to start
YOUR OWN BUSINESS
and *stay* in business



What does it take to start your own business, *right*, so that you can make a go of it? Here are the answers—a really informed, authoritative book by a business and marketing consultant of international reputation, outlining for you the things you want to know, the things you have to do, to go into business for yourself *with every possible chance for success!*

Just Published

Going Into Business for Yourself

By O. FRED ROST

Editor, *Wholesaler's Salesman*

334 pages, 5½x8, 19 illustrations, $3.00

Starting from scratch by helping you decide the business to which you are best suited, this book guides you step by step through the problems of financing, legal aspects, choosing the location, bank dealings, records, insurance, etc., and gives sound, constantly helpful pointers on buying and selling. Finally, it gives actual thumb-nail sketches of performance records in twenty-four types of businesses that have proved to be successful.

AMERICAN BUSINESS says: "Containing more factual information of value than ten ordinary books on this subject this 334-page volume tells more about retailing than any other book we have ever read . . . the book gets down to cases right at the jump-off and from there on every page contains something the man going into business ought to know—and something which only about one in ten actually does know."

See that you know what all these key points are, the facts and steps that are vital in settling each question, the important cautions to observe, with the aid of this practical book.

It covers everything from what licenses you need to Social Security essentials, from how much rent you should pay to hints on buying. Read it for the guidance you need in protecting your investment and giving yourself the best chance for success in the increasingly scientific, competitive, and regulated field of business proprietorship.

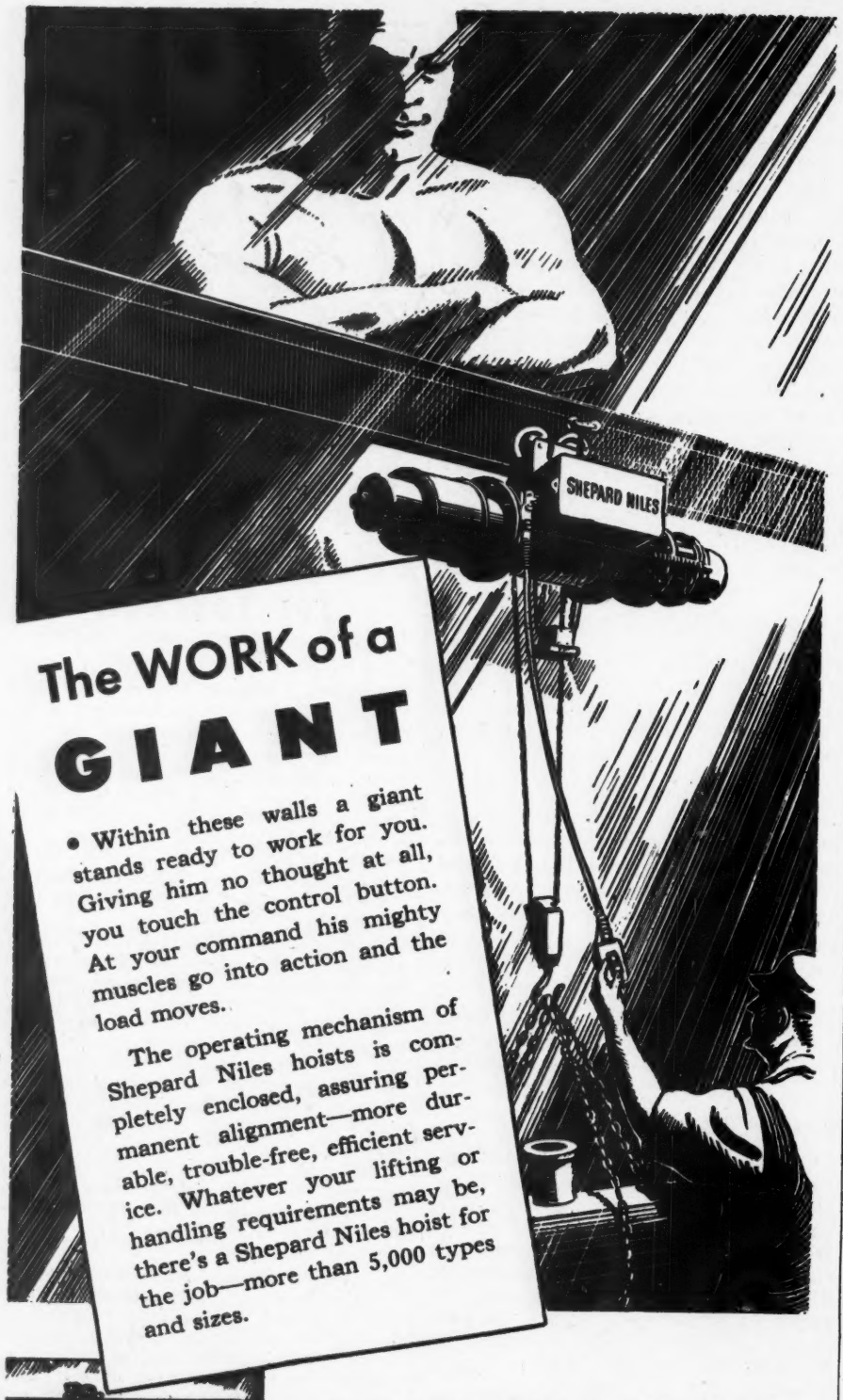
Send for Rost's GOING INTO BUSINESS FOR YOURSELF today, for 10 days on approval. It will help you to make "going it on your own" certain to be an interesting adventure, perhaps *the* greatest adventure of your life!

Simply mail this coupon

McGraw-Hill Book Co., 330 W. 42nd St., New York 18

Send me Rost's **GOING INTO BUSINESS FOR YOURSELF** for 10 days' examination on approval. In 10 days I will send $3.00 plus few cents postage or return book postpaid. (Postage paid on cash orders.)

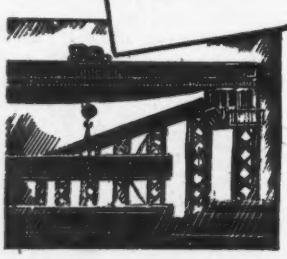
Name .....
Address .....
City and State .....
Company .....
Position .....Food 2-46



The WORK of a GIANT

• Within these walls a giant stands ready to work for you. Giving him no thought at all, you touch the control button. At your command his mighty muscles go into action and the load moves.

The operating mechanism of Shepard Niles hoists is completely enclosed, assuring permanent alignment—more durable, trouble-free, efficient service. Whatever your lifting or handling requirements may be, there's a Shepard Niles hoist for the job—more than 5,000 types and sizes.



Powerful and rugged, Shepard Niles Cranes are available in any desired capacity and span—designed to handle greatly varying loads with precision, safety and economy. Shepard Niles Cranes have the same sound, progressive features as do the Shepard Niles Hoists. A request will promptly bring illustrated bulletins.

Shepard Niles
CRANE & HOIST CORPORATION

The experience and facilities of Shepard Niles engineers are at your service. Plan ahead now for the right material handling equipment. Your inquiry will receive prompt attention.

350 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

and packaging foods. Two or three miscellaneous chemicals got into section three which might normally be sought in section one or two. These include weed killers, legume inoculants, and plant hormones appearing at the end of section three.

Within each section the chemicals that are most important are discussed briefly as to relative quantities employed, qualities required, and general conditions of use. Statistical information is presented wherever possible. Data through the 1945 crop seasons are shown in many cases.

GOVERNMENT PUBLICATIONS

COMMERCIAL ICE CREAM FORMULAS. By Alan Leighton. Bureau of Dairy Industry. BDIM-Inf-11 (Revised August, 1945.) Available on request to Bureau of Dairy Industry, Washington 25, D. C.

COOKING WITH DRIED EGGS. Bureau of Human Nutrition and Home Economics. AIS-28. Available on request to Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

REPORT OF THE FEDERAL TRADE COMMISSION ON DISTRIBUTION METHODS AND COSTS. Part VI. Milk Distribution, Prices, Spreads and Profits. Submitted to the Congress, June 18, 1945. Available from Superintendent of Documents, Washington 25, D. C. Price, 15 cents.

A HANDBOOK ON WAGE INCENTIVE PLANS. War Production Board. Available from Superintendent of Documents, Washington 25, D. C. Price, 10 cents.

FACTS FOR INDUSTRY, INDEX OF PUBLICATIONS, October, 1945. Bureau of the Census. Available on request to Bureau of the Census, Washington 25, D. C. The Census Bureau has released an index of the numerous periodical statistical statements which it now issues monthly, quarterly, or at other appropriate intervals, giving information for the guidance of industrial executives. A few of these relate to the food industries. Others relate to industries of indirect or negligible interest.

NOTES ON PRACTICAL WATER ANALYSIS. By W. D. Collins. Geological Survey. Water-Supply Paper 596-H. Available from Superintendent of Documents, Washington 25, D. C. Price 10 cents.

WARTIME SHIFTS IN FEED AND LIVESTOCK PRODUCTION. By Worley S. Earp and Eileen McDonald. Department of Agriculture Miscellaneous Publication No. 569. Available from Superintendent of Documents, Washington 25, D. C. Price 15 cents.

PATENTS

CEREALS AND GRAINS

Stored Grain Treated for Insect Infestation by Fumigation With Mixture of From 2.5 to 20 Percent by Volume of Ethylene Bromide in Carbon Tetrachloride—Fred W. Fletcher and Eugene Kenaga to Dow Chemical Co., Midland, Mich. No. 2,391,890. Jan. 1, 1946.

Stringy Character of Finely Ground Dehulled and Destarched Oats Cooked in Water or Milk Overcome by Addition of 10 to 35 Percent by Weight of Gelatin Before Cooking — Sidney Musher to Musher Foundation Inc., New York, N. Y. No. 2,391,474. Dec. 25, 1945.

DAIRY

Evaporated Milk in Cans Heat-Treated in Chamber Equipped With Helical Canway to Give Agitating Motion to Contents of Cans During Passage Through Heat Exchanger—Albert R. Thompson, Los Gatos, Calif., to Food Machinery Corp., San Jose, Calif. No. 2,391,203. Dec. 18, 1945.

Milk Heat-Treated on High Temperature Short-Time Cycle to Inactivate Enzyme Phosphatase and Kill "Escherichia coli" Without Injuring Creaming Properties—Arthur C. Dahlberg, Geneva, and Robert F. Holland, Seneca Castle, N. Y., to Cherry Burrell Corp., Chicago, Ill. No. 2,390,872. Dec. 11, 1945.

DEHYDRATION

Puree-Type Soup, Free From Substantial Quantities of Fat, Dehydrated in Form of Aggregates With Large Surface Areas Per Unit Weight—Louis J. Huber, Minneapolis, Minn., to General Mills, Inc. No. 2,391,829. Dec. 25, 1945.

Tomato Juice Containing 5 to 10 Percent Solids Blended With 1 to 50 Percent Finely Divided Gelatinized Edible Carbohydrate and Spray Dried—Elmer F. Glabe, Chicago, Ill., to Stein, Hall & Co., Inc. No. 2,392,241. Jan. 1, 1946.

FATS AND OILS

Glyceride Oils Dehydroxylated by Spreading in Thin Layer and Applying Vaporizing Heat—Ivor M. Colbeth, East Orange, N. J., to Baker Castor Oil Co., Jersey City, N. J. No. 2,392,119. Jan. 1, 1946.

FRUITS AND VEGETABLES

Green Vegetables Blanched in Hot Water and Subjected to Alkaline Treatment at Lower Temperature To Preserve Color and Firmness—Walter L. Schroder, Hortonville, Wis., and Thomas A. Rogers, Deceased, by Edith H. Rogers, Executrix, Stevens Point, Wis. No. 2,390,468. Dec. 4, 1945.

Peaches Automatically Cut in Half, Pitted, and Peeled in Continuous Manner—Raymond L. Ewald and Henry A. Skog, Olympia, Wash., to Special Equipment Co., Portland, Ore. No. 2,388,682. Nov. 13, 1945.

Tomato Juice Extracted, Seasoned, Heat-Treated to Sterilizing Temperatures Under Pressure, Cooled to About 210 Deg. F. by Flash Vaporization, and Packaging in Continuous Manner—Horace L. Smith, Jr., Weld E. Conley, Jr., and Wilfried L. Atwood, Richmond, Va., to Chain Belt Co., Milwaukee, Wis. No. 2,392,197. Jan. 1, 1946.

MEAT AND POULTRY

Hams Prepared for Drying to Less Than 50 Percent Moisture Content By Removing Bone, Filling Cavity With Gelatin, and Pressing to Exclude Air and Form Compact Mass—Elmer C. Oswald and Reese Gardiner Lewis to Armour and Co., Chicago, Ill. No. 2,391,338. Dec. 18, 1945.

Gelatin Treated With Volatile Refrigerant to Prevent Agglomeration of Gelatin Granules When Wetted With Water—Maurice Strenitz to Industrial Patents Corp., Chicago, Ill. No. 2,392,297. Jan. 1, 1946.

PACKAGING

Solid CO_2 Packed in Metal Cans With Product Capable of Absorbing CO_2 Gas to Test Cans for Leaks—Harry M. Slosberg, Ames, Iowa, to Continental Can Co., Inc., New York, N. Y. No. 2,391,354. Dec. 18, 1945.

SUGAR

Hard Wax Extracted Directly From Sugar Cane Muds—Werner F. Goepfert, Oradell, N. J., to Interchemical Corp., New York, N. Y. No. 2,391,893. Jan. 1, 1946.

Sugar Solutions Purified by Heating, Liming, Filtering and Ion-Exchange Treatment—Franklin Nathan Rawlings, Westport, Conn., to The Dorr Company, New York, N. Y. No. 2,391,843. Dec. 25, 1945.

VITAMINS

Bitter Taste Principles Removed From Vitamin B Complex Concentrates—Aaron Arnold, East Orange, and Carl Bernard Schreffler, Montclair, N. J., to National Oil Products Co., Harrison, N. J. No. 2,390,679. Dec. 11, 1945.

MISCELLANEOUS

Caffein Extracted From Coffee by Chlorinated Organic Solvent of Low Polarity, Adsorbed From Solvent on Clay, De-adsorbed From Clay by Non-Chlorinated Organic Solvent of High Polarity and Recovered From Second Solvent—Roland E. Kremers, Summit, N. J., to General Foods Corp., New York, N. Y. No. 2,391,981. Jan. 1, 1946.

Packaged Food Sterilized in Multiple Package Retort—Duryea Bensel, to Bensel-Brice Corp., Los Angeles, Calif. No. 2,389,117. Nov. 20, 1945.

Polysaccharide Fermented by Leuconostoc mesenteroides" (Cienkowski) Van Tieghem in Presence of Nutrient Medium Containing Autolyzed Yeast, Blood and Tankage to Produce Gum Dextran—William Ludwell Owen, Jr., and William L. Owen, Baton Rouge, La. No. 2,392,258. Jan. 1, 1946.

Vinegar Made in Recirculating Fermentation System—Ernst Julius Bruno Knebel, Upsala, Sweden. No. 2,390,717. Dec. 11, 1945.

U. S. Patents Available For Licensing or Sale

Further information concerning these patents is obtainable from the U. S. Patent Office, Washington, D. C. They should be identified by their Register Number as well as by their Patent Number. Names given are those of owners of the patents.

Eggs Mechanically Sorted and Graded Regardless of Shell Color by Use of Radio Frequency — Cornell Research Foundation, Cornell University, Ithaca, N. Y. No. 2,362,774; granted Nov. 14, 1944. Register No. 450.

Ground Roasted Coffee Flaked and Compressed Into Compact Tablets Which Will Not Easily Crumble and Can Be Packed in Cartons—Walter W. Willison, 638½ Arlington Place, Chicago, Ill. No. 2,371,093, granted March 6, 1945. Register No. 298.

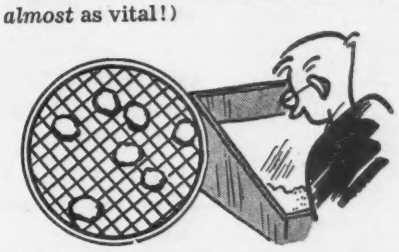
Nuts Treated With Powdered Anhydrous Aluminum Chloride to Soften Hulls Without Discoloration and Without Injury to Kernel That They May Be Cracked By Pressure of Fingers—Mrs. Mildred B. Frazier, Wilmington, Del. No. 2,277,485; granted March 24, 1942. Register No. 696.

HOW TO SEPARATE A CAT FROM A MOUSE

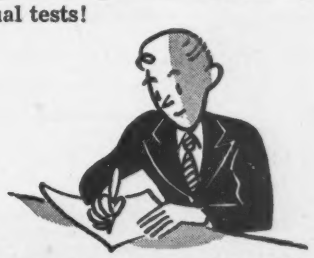
● Simply a matter of screening . . . a useful trick for a mouse to know. In fact, screening is a useful trick in any trade. . . . even the salt business!

You see, in the salt business we've got to fit the salt to the job. Butter-makers don't want large, slow-dissolving crystals in Butter Salt. We remove the "big ones" so completely, you won't find even a trace on a 28-mesh Tylor screen. But they don't want fine dust, either, to cause pasting in the churn. Diamond Crystal Butter Salt contains only 3% of particles small enough to pass through a 65-mesh screen!

Yes, it's as vital to the butter-maker that we remove over-sized and under-sized salt crystals . . . as it is to the mouse to screen out that cat. (Well, *almost* as vital!)



Happily for the mouse, he got results. And so do we at Diamond Crystal. That's why you can always be sure of clean screening whenever you specify Diamond Crystal. Take your choice of grade or grain size—it's tops by actual tests!



Want Free Information on Salt? Write Us!

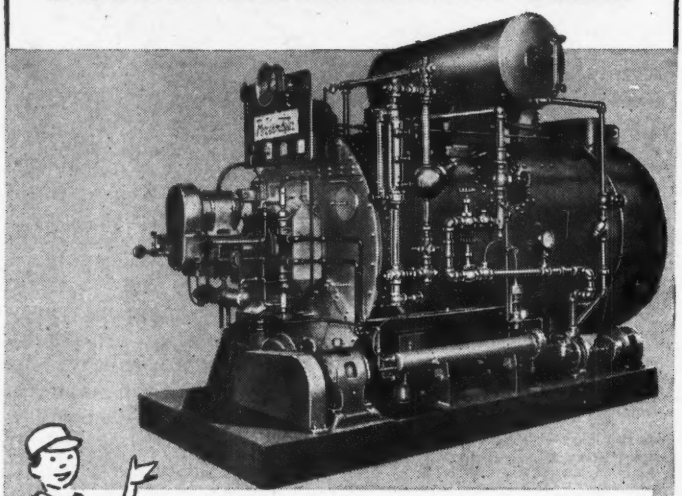
If *you* have a salt problem, let our Technical Director help! Just drop him a line in care of Diamond Crystal Salt, Dept. J-11, St. Clair, Michigan.

DIAMOND CRYSTAL
ALBERGER PROCESS SALT

Replace Your Old Boiler With a Ready-To-Use

Powermaster

STEAM GENERATING UNIT



Here's Why the O & S Powermaster gives you top performance . . . . .

1 COMPLETELY "PACKAGED" UNIT with oil burner, all controls and condensate return system *built in* — ready to use when delivered.

2 SPEEDY STEAM PRODUCTION — designed to deliver full pressure from cold water in 18 minutes or less.

3 HIGH OVERALL EFFICIENCY with low-cost operation assured by new simplified O & S design.

4 INTEGRAL OIL BURNER, specially designed for Powermaster, produces a "spinning flame" for complete combustion and highest thermal efficiency.

5 FULLY WIRED AND MOUNTED — no smoke stack or foundation work needed — compact, space-saving, easy to clean.

GET Powermaster Bulletin No. 1213 for full information—write to Orr & Sembower, Inc., 932 Morgantown Rd., Reading, Pa

ORR & SEMBOWER INC.

READING O&S PENNA.

Builders of Better Boilers Since 1885

Packaged Unit Generates Steam Automatically For Food Processing

The Powermaster is a completely engineered steam plant; installed in a few hours; delivers full pressure in 18 minutes or less.

The trend today is toward completely "packaged" units. Bulky, space-eating boilers—with condensate return tank, oil burners and even controls separately installed and inconveniently located—are on their way out. Far-sighted plant engineers with an eye to fast, low-cost steam and minimum maintenance, are replacing them with Powermasters.

This new automatic oil-burning steam generator is complete in every sense of the word. Boiler, Oil Burner, Condensate Return System and Automatic Control System are engineered into a compact, light-weight unit. Fully wired and mounted on structural steel base, the Powermaster is "ready to go" at the flick of a switch.

The overall efficiency and dependable performance of the Powermaster is indicated by its wide use by the U. S. Army and Navy, in camp, in the field and—in mobile units—on the march throughout America and across the seas.

The Powermaster Steam Generator from 15 to 150 h.p. is now available for use with either light or heavy oil, ready to produce steam needed in your plant for heating, power and processing.

A Powermaster innovation is the forced draft feature, eliminating the need of a stack for draft purposes. A small vent carries off combustion gases. Users report full steam pressure is produced from a cold start in as little as 18 minutes, automatically. No time-consuming preparation. No stoking. No delays.

The Powermaster is equipped to return usable hot condensate to your boiler. Condensate from the heating system and make-up water is returned to a storage tank mounted on the unit itself. A float-operated valve controls the water level. It, too, is automatic.

If you have a steam generating problem, investigate the O & S Powermaster Unit. To get complete information, write for a Powermaster Bulletin. Address your request to Orr & Sembower, Inc., 932 Morgantown Road, Reading, Pa.

ADVERTISEMENT

Letters to the Editor

Food Technologists

In the March issue we shall conclude this series of comments on "Salaries for Food Technologists." The reactions have been thought provoking. They suggest a need of broader training, particularly on orienting a prospective food technologist as to what it takes to get ahead in business. Perhaps something akin W. R. Van Meter's advice in this issue to a young aspirant to foremanship would be in order to show the youngster "the way to promotion and pay," the art of salesmanship of one's intellectual wares.—The Editors.

Things Poor Richard Doesn't Understand

To the Editor
Of FOOD INDUSTRIES:

As an employer, I would not want to be associated with "Poor Richard". The thing that this author does not quite understand is that there are a good many angles to a successful business and usually the technologist is qualified in only one of them. The business will not be successful unless it has other well qualified people to handle operations, sales, advertising, finances, etc. There has always been a shortage of men who have the all-around ability to guide a successful business, and the wailings of "Poor Richard" or other scientists who lack some of these qualities will not be sufficient to change their economic status.

There is one point on which I do agree with "Poor Richard" when he says that the technical man "don't have the foggiest notion of the commercial worth of the skills they want to sell." I think I could go a bit further than "Poor Richard" and say that some of the technical men do not know what skills are required to be successful.

The technical skills may be the least salable and the least valuable to an industrial organization. I am convinced that one who possessed these other skills in addition to his technical ability will be able to handle himself and would not have conceived the "Poor Richard" article.—*Vice President, Company E.*

Brickbat

To the Editor
Of FOOD INDUSTRIES:

JUST a word of comment on your article "Salaries to Food Technologists" in the October issue. Frankly, I think, matters of this kind have no place in your magazine. It does no good, in fact does a lot of harm, in these trying times. I have felt in the past that the purpose of your magazine was to keep us informed on New Processes, New Machinery, New Ideas on Food Processing. The average concern has trouble enough today without being exposed to the individual opinion of outsiders as to what they pay their employees.—*President, Company F.*

Gripe About Questionnaires

To the Editor
Of FOOD INDUSTRIES:

SINCE the surrender of Germany, various personnel men have been quizzing returning soldiers and sailors in camps and hospitals throughout this part of the country in an effort to get a line on the thinking of the returned veterans towards reentering industrial employment.

The training supervisor for a railroad summarizes the situation in the following statement: "Job application blanks are scaring returning veterans away from work. They take one look at the typical complicated, archaic form and at once are resentful. To a man, they say, 'We've had enough of that in Service!' "

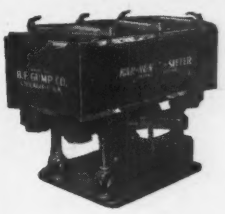
In talking with one of our returned air force men, I had practically the same thing told to me. Further, he is highly resentful over the professional psychological hurdle-jumping and periodic interviewing done by the personnel department of the airplane-engine company for which he is now working. He is an engineering school trained man, in addition to being a discharged wounded air force mechanic. He is resentful towards the psychological hijinks because he says that they are all slanted for individuals who have a mentality of about 7 to 9 years of age, and are being applied by individuals who show very little evidence of having passed edult psychological tests themselves—if there is such a thing as an intelligent adult psychological test. His chief gripe is that these psychological tests do more to stir up hostility and build up incompatibility than they do to minimize or smooth out difficulties.

He has gone on to tell me that he has talked this subject over with a number of other returning veterans and finds that they are unanimous in their point of view that the CIVILIANS —AND NOT THE RETURNING VETERANS —NEED MENTAL AND SOCIOLOGICAL ADJUSTMENTS.—*An Executive, Company G.*

AT THE CHEMICAL SHOW

Equipment For
• SIFTING
• PACKING
• FEEDING
• WEIGHING

• BAR-NUN ROTARY SIFTERS



Modern, big capacity, rotary motion sifters with mechanical bearings throughout. Assure complete, thorough separations and uniformity of product. One to four separations . . . for sifting, scalping or grading.

• VIBROX PACKERS

Efficient, smooth-running, vibrating packers that usually pay their own costs through reduction of labor, handling and container costs in a short time. Made in five sizes to pack containers from 5 to 750 pounds.

• DRAVER FEEDERS

Accurately fed by volume, a predetermined amount of dry, powdered, flaked or granular material. Capacities accurately controlled. Also used for continuous mixing systems. Over 100 sizes and models.

• CHECK THIS GUMP EQUIPMENT

See it at the chemical exhibition. Learn how you can bring to your own plant the more efficient, economical processing of dry, powdered or granular materials. Let Gump engineers suggest installations to meet your needs. You'll be welcome at

BOOTH NOS. 205-6

DRAVER CHEMICAL FEEDER

B. F. GUMP CO.
Established 1872
454 South Clinton Street, Chicago 7, Ill.
MAKERS OF: *Equipment for Grinding, Sifting, Mixing, Feeding and Weighing of Dry Food Products.*

NO. 6TH MIKRO-ATOMIZER

At the New York Chemical Show you'll see the NEW MIKRO-ATOMIZER, a mechanical, screenless, compact and highly efficient mill for production of ultra-fine powders from 1 to 25 microns, and the brand new No. 5 MIKRO-ATOMIZER designed for small production, pilot plant and laboratory work.

In addition, there will be shown the full line of MIKRO-PULVERIZERS from the small Bantam to the largest No. 4, including the PADDLE FEED MIKRO-PULVERIZER for wet filter cake and heavy paste materials—a new PRE-CRUSHER for breaking large lumps of filter cake—the ROTARY AIR LOCK, or continuous unloading valve.

All these, together with many other modifications of the MIKRO-PULVERIZER designed for standard and special applications will be on display. Come and look them over, ask questions—there'll be engineers there to help you with *your* pulverizing problems.

VISIT
our Booths Nos. 246-247 on the mezzanine. Chemical Show, Grand Central Palace, New York City, Feb. 25 - Mar. 2.

PULVERIZING MACHINERY COMPANY
97 CHATHAM ROAD • SUMMIT, N. J.
NOW...2 TYPES TO MEET MOST PULVERIZING JOBS

MIKRO-PULVERIZER (FINE)
MIKRO-ATOMIZER (ULTRA FINE)
Reg. U. S. Pat. Off.

Foreman

(Continued from page 75)

they are. Under no circumstances indulge in criticism of company policies or of your superiors to others. In the first place, such talk is a waste of breath because what you say is not going to change anything. In the second place, a man who is heading for the post of foreman in an organization should have reached sufficient maturity to know that he should keep his mouth shut about a number of things. Indulging in a lot of critical talk is merely proof to others that you are still in the kid stage.

The points about your relationship to the other men in the shop can be summed up as follows:

1. Be cheerful and pleasant with everyone. A foreman sets the pace for most of the men under him and if you expect to be able to do a foreman's job, adopt a permanent attitude of self-control and cheerfulness.

2. Learn to keep your own counsel. It is demeaning to go crying on somebody's shoulder, or to seek continual encouragement from someone else. If you have the responsibility of leading other men, you've got to be able to boss yourself as well.

3. Learn to profit from constructive criticism. Regardless of how, or by whom the criticism is offered, if there is anything in it of a nature you can use, take it gracefully. If there isn't, it would be just as well to take it gracefully anyway. You may have better luck next time.

How to "Sell" Yourself

The question of bringing your abilities to the favorable notice of your employer should also be studied. This is an angle of the problem of advancement which is just as important as the other two, yet is the one most frequently fumbled by men who want to get ahead. What can you do about this?

Such simple things as being punctual and being on deck every day create a much greater impression in the minds of most employers and supervisors than workers realize. If you doubt this, wait until you've been a foreman for a few months. See what your opinion then is of Joe So-and-so, who gets in ten minutes late at least twice a week, or of the couple of buddies who have to take an extra day off after all regular holidays for purposes of recuperation. Plain, everyday punctuality and consistent on-the-jobness are vitally important ways to impress the boss with the idea that you are excellent foreman material.

WANT A CAN LABEL THAT'S DIFFERENT ?

Designed by
SHELLMAR
using
ALCOA
Aluminum Foil

Not just different but *better!* Aluminum foil labels leap to the eye. Their sparkling, clean-cut beauty makes them eye-stoppers on any shelf or counter.

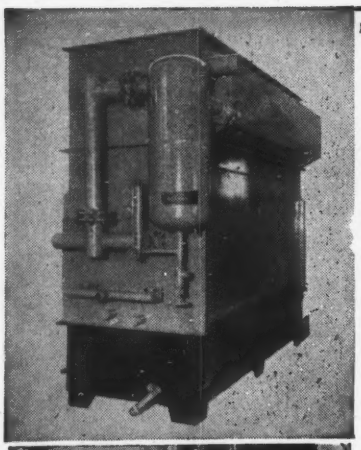
On fibre cans they have additional advantages: Foil labels give fibre cans a metal can appearance. Also, foil is greaseproof and insectproof. And by reflecting radiant heat, they keep contents cooler.

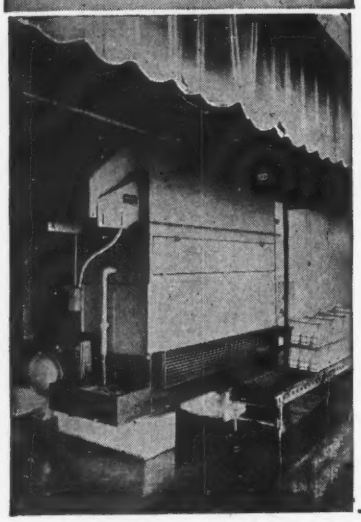
Your label designer and printer will be interested in these facts: Alcoa Aluminum Foil comes in either bright or satin finish, plain, lacquered or embossed. It is paper-backed to facilitate bonding to the can and give extra strength. Printing, in any colors you want, can be done on Alcoa Foil by practically any of the standard printing processes. Colors can be made opaque or sufficiently transparent to allow the metallic sheen to show through.

Have your label designer submit ideas for foil labels. For samples of Alcoa Foil, write ALUMINUM COMPANY OF AMERICA, 1845 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA

ALCOA ALUMINUM FOIL





PATENTED

NIAGARA Duo-Pass *AERO CONDENSER with the "OILOUT"

... increases plant capacity for refrigeration users, saves power, saves condenser water. "Duo-Pass" (patented) reduces condensing temperature, prevents scaling and clogging of condenser tubes. "Oilout" (patented) removes oil and dirt from refrigerant, assuring full capacity. *Write for Bulletin 91.*

**Trade-Mark Registered*

NIAGARA

"No Frost" METHOD of Refrigeration

Increases refrigeration capacity from existing compressors — saves power—saves maintenance trouble and attention—increases plant production and earnings. With the "NO FROST" Method you always have full capacity with never any refrigeration loss from frosted coils.

Write for Bulletins 83 and 95.

NIAGARA BLOWER COMPANY

"30 Years of Service in Industrial Air Engineering"

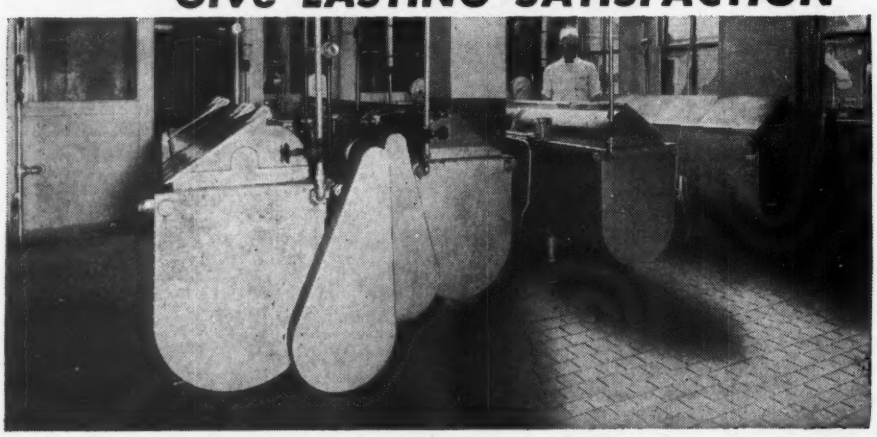
Dept. F. I. 26, 6 E. 45th St., New York 17, N. Y.

Field Engineering Offices in Principal Cities

PATENTED

NUKEM *Acid-Proof* FLOORS

Give LASTING SATISFACTION



You get ALL these superior features in NUKEM Acid-Proof floors:

1. Immunity to all commercial acids—including acetic and lactic acids, vegetable and fruit juices, sugars, etc.—as well as alkalies and solvents.
2. NUKEM floors are leak-proof and wear-proof.
3. They are attractive and easy to keep clean.

Canneries, Dairies, Ice Cream Plants, Cheese Factories and other food processing industries use NUKEM floor construction. Some installations have been in use 20 years with no time out for repairs.

Ask to have a NUKEM engineer recommend the type of floor best suited to the conditions in your plant. There is no obligation.

NUKEM PRODUCTS CORP.

108 COLGATE AVENUE, BUFFALO 20, N. Y.

Write for this booklet

Make Sensible Suggestions

Being alert for improvements in the way of doing things is also a "must." If there is a suggestion system in the plant, use it. If not, work through your foreman. But, please, before you sound off, make sure that what you are suggesting is practical, actually a benefit, and won't cost more to put into operation than can be saved by it.

Look at all the angles to the suggestion before you submit it. Know the bad points of it, as well as the good ones. Figure the approximate cost in money of putting it into operation. Against this, set the saving. Suppose you owned the bakery and this suggestion came to your desk. How would you feel about it? You must know what you are talking about before you open your mouth, for if it happens the other way around more than once or twice, don't be surprised if no one listens to you the third time.

People, don't you forget, are human. They have likes and dislikes, and these feelings govern their behavior to a much greater extent than they will admit. Consequently, it is up to you to know some of the more obvious likes and dislikes of your foreman, of the production superintendent, of Mr. Big who owns the plant.

This is not advice to be a "bootlicker" or a flatterer, but it is intended to point out that one of the first steps in bringing your abilities to the notice of those above you involves knowing what it is they want to see. If Mr. Big doesn't like mustaches on mixers, or tobacco chewing while at work, you've got to decide fast in case you are proud of your handlebars, or your ability to hit an egg can at twenty paces.

Make Good With Your Present Foreman

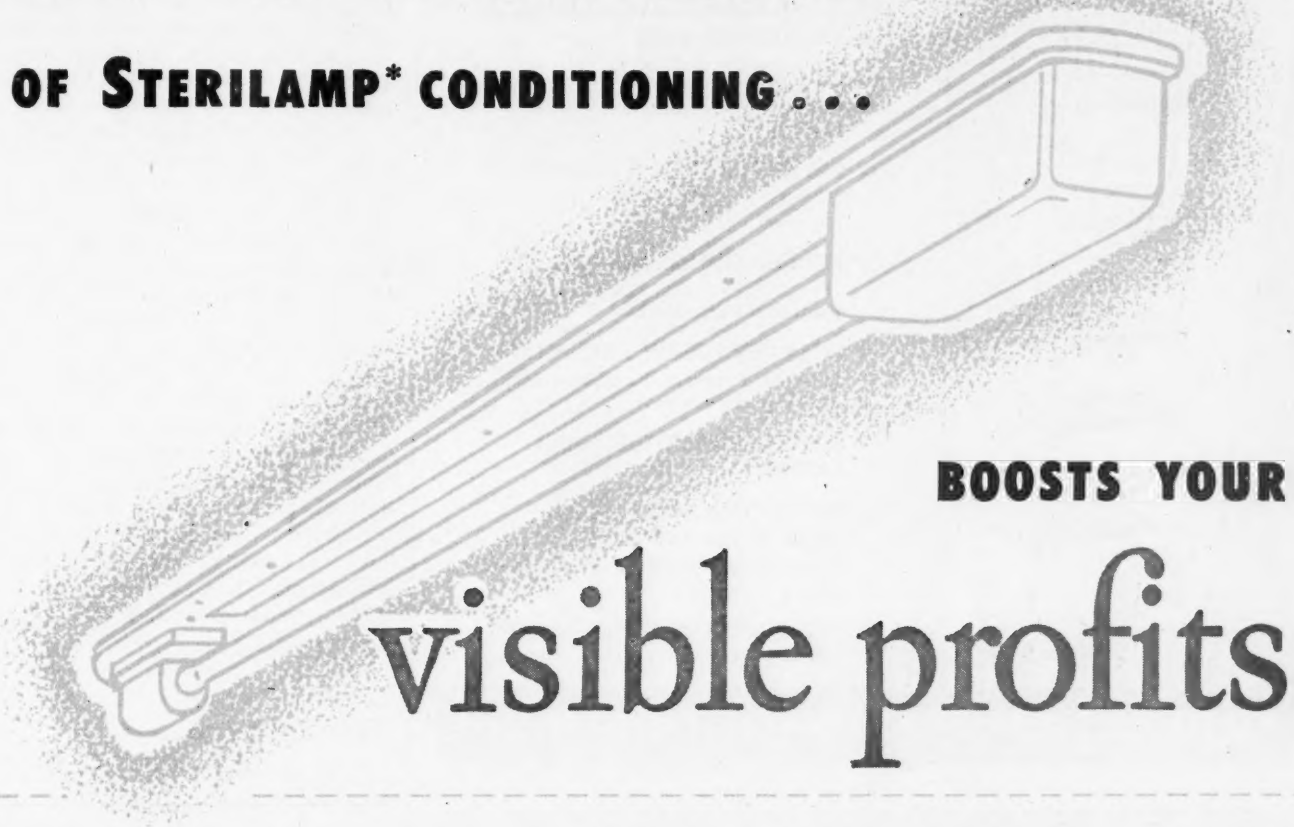
You've got to do the same thing with your own foreman. After all, most of the reports concerning you and your work are going to reach those higher up first of all from the lips of the foreman. So it is important that the proper relationship be established with him, too.

Asking for More Responsibility

Now then, after a reasonable length of time in which you have made progress in all these things, you request permission for an interview with the production superintendent. Or, an opportunity to talk to him arises spontaneously. You let him know of your interest in getting more responsibility. You tell him what you have been doing in the

invisible radiation

OF STERILAMP* CONDITIONING . . .



BOOSTS YOUR

visible profits

You don't *see* the millions of *invisible* ultraviolet rays which STERILAMP CONDITIONING produces to destroy airborne contaminations. But—

You *see* your profits rising *visibly!* For you reap these benefits when you install STERILAMP CONDITIONING in your bakery—

1. STERILAMP CONDITIONING—the Westinghouse engineered application of bactericidal, ultraviolet radiation—*destroys* the airborne bacteria and mold spores which ruin baker's profits.

2. STERILAMP CONDITIONING enables you to set up lower cost, better housekeeping for your bakery. It prevents the spread of airborne contamination throughout the bakery, including dough rooms and proofing rooms and at every stage of cooling, slicing and wrapping.

3. You thus save time and labor costs of frequent scraping and repainting to remove mold.

Bakers everywhere report successful installations. Investigate the application of economical STERILAMP CONDITIONING to *your* bakery. Our representative will gladly call and give you free advice *with no obligation.* Fill in and mail the coupon below—*today!*

IF IT'S A STERILAMP IT'S Westinghouse

Mail this Coupon Now

STERILAMP DEPT. BF
Westinghouse Electric Corporation
Bloomfield, New Jersey

(1) Send me more information.

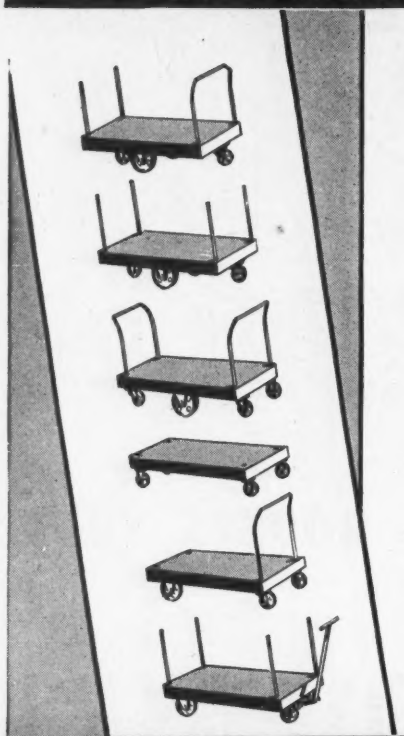
(2) Have your representative call.

Name.....

Address.....

© 1946, Westinghouse Electric Corporation
*Reg. U. S. Pat. Off.

STANDARDIZED
MATERIALS HANDLING EQUIPMENT



LOAD-CARRIERS

★ STANDARDIZED TYPES
Capacity up to 5000 lbs. 30″ wide x 60″ long
(Economy in Production — Low Cost)

★ ONE PIECE ALL STEEL DECK AND CHASSIS
(Great Strength and Lightness Thru Engineering)

★ ROUNDED CORNERS AND EDGES
(Prevents Injury to Materials, Equipment and Personnel)

★ EXTRA DEEP BUILT-IN STAKE POCKETS
(For all Types of Endracks, Stakes and Superstructures)

★ EXCLUSIVE MARKET FORGE BUILT CASTERS

★ ANTI-FRICTION ROLLER BEARINGS IN ALL WHEELS AND CASTERS
(Concentric Wheels for Easier Moving)

★ AUTOMOBILE TYPE SOUND PROOFING
(Special Mastic Applied to Underside)

MARKET FORGE COMPANY, 87 GARVEY ST., EVERETT 49, MASS.

Specify HEAT SEAL FOOD LABEL
to Identify YOUR FOOD PRODUCTS

For banding frankfurters, sausages, and other prepared foods in conformity with the Pure Food Laws. Odorless . . . easily attached . . . heat sealing. Sticks to moisture-proof heat-sealing cellophane at 225° F.

Samples illustrated above courtesy St. Louis Sticker Company

ASK YOUR PAPER MERCHANT OR WRITE US
FOR TEST SAMPLES OF HEAT SEAL FOOD LABEL PAPER

McLAURIN-JONES CO.
492 MacLaurin Street • Brookfield, Mass.

way of acquiring greater knowledge of baking operations. Ask for the opportunity to be put in temporary charge of a group of men, or of an operation, during period when because of vacation, sickness or other reason, the regular foreman is absent. It means becoming a kind of understudy to the foreman, and the training you will get will be of value both to you and the company.

Such a program as has been outlined here is intended to serve as a guide for you over a period of time. It is not a program that can be completed overnight. From the suggestions offered, take what you can use easily and immediately in your daily work, and you will find that one step leads to another.

An intelligent, ambitious young man in the bakery who has followed some such schedule of self-training and helping himself will be ready and able to take over a foreman's job when the opening comes.

As Abraham Lincoln once said—and as many another ambitious young man has said since then—"I shall prepare, and some day my chance will come."

—End—

Orange Juice

(*Continued from page 101*)

making an "orangeade." He decides to put 15 percent "orange juice" into the drink. Using 65 deg. Brix, Concentrated "Orange Juice" from Florida or California, he has on a Brix basis alone the differences shown in Table I.

It is not beyond the realm of possibility that, with the increased public acceptance of citrus fruit juices he will sell 2,000,000 gallons of "orangeade" on a country-wide basis. Let us assume that he is to have 15 percent "orange juice" in his finished "orangeade." Manufacturer A then requires 15 percent of 2,000,000 gallons of "orangeade," or 300,000 gallons of "orange juice."

If he is using concentrate for his juice content (this is a hypothetical case and in no way is it to be interpreted that I suggest the use of concentrated "orange juice" for this purpose), he could use either 51,700 gallons of 65-deg. Brix concentrate made out of 14 deg. orange juice, or 32,600 gallons of 65-deg. concentrate made out of 9 deg. orange juice. This is a difference of almost 20,000 gallons of concentrate to obtain his 300,000 gallons of "orange juice" diluted back to its original soluble solid content. At January, 1946, prices of about $5.00 a gallon for 65-deg. Brix

FAR MORE than the eye can see

WHEN you look at a forest, you may see only a maze of trees, but an expert timber estimator can walk through and report its "stand" with remarkable accuracy.

In packaging, the maze of different varieties in paper is equally bewildering. Only a few kinds are ever mentioned in our advertising, and a "general Riegel catalog" would be impossible.

But Riegel experts know the entire forest of special packaging, converting and industrial papers. Our files contain more than 600 different grades . . . and we have the "know-how" and the manufacturing facilities to produce exactly the right paper for each individual product.

Even now, Riegel customers are being advised of special papers that resulted from our war effort, and that will be available as soon as conditions permit. We would also like to discuss Riegel papers with you.

600 RIEGEL Papers

Riegel packaging papers include glassine, greaseproof, sulphite, wet-strength . . . printed, embossed, resin-impregnated, laminated, oiled, lacquer-coated, waxed, dry-waxed . . . as well as printing papers, converting papers and special industrial papers in endless variety.

RIEGEL PAPER CORPORATION • 342 MADISON AVENUE • NEW YORK 17, NEW YORK

OVER HALF A CENTURY
OF KNOWING HOW
1890-1946

CRCO CONFIDENCE
... born of experience

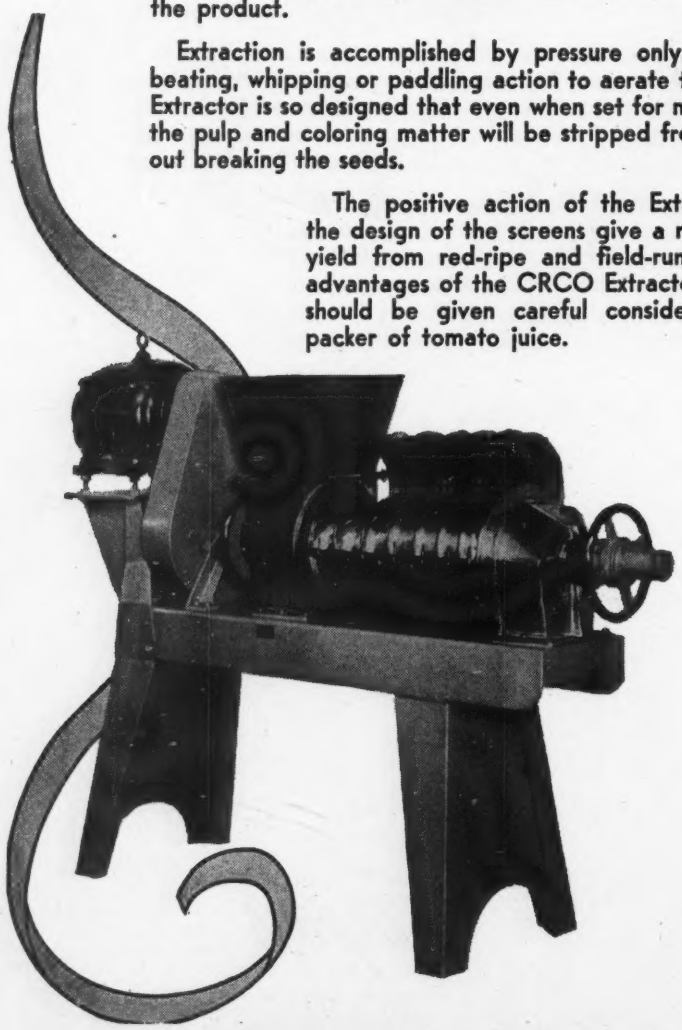
CRCO-American
EXTRACTORS

Give Maximum Efficiency in Any Juice Line

CRCO-American Juice Extractors will give from 75% to 90% recovery of tomato juice at capacities up to 60 gallons per minute, depending on the model of Extractor and the condition of the product.

Extraction is accomplished by pressure only, there being no beating, whipping or paddling action to aerate the product. The Extractor is so designed that even when set for maximum recovery the pulp and coloring matter will be stripped from the skins without breaking the seeds.

The positive action of the Extractor screw and the design of the screens give a much higher color yield from red-ripe and field-run tomatoes. The advantages of the CRCO Extractors are many and should be given careful consideration by every packer of tomato juice.



WRITE FOR BULLETIN

THE BEST OF Everything

CHISHOLM-RYDER
Niagara Falls, New York
FOR THE FOOD PROCESSOR

orange concentrate, this difference of 20,000 gallons of concentrate would equal $100,000!

This example shows that our current use of the words orange juice is inadequate. The foregoing attitude toward the words "orange juice" adds up to $100,000. Does that make sense or nonsense?

However, following the suggestions below can help to forestall our present indefinite use of the words "orange juice." I again reiterate: (1) Be conscious at all times of the multiplicity of meanings the words "orange juice" possess; (2) qualify the words orange juice (see the Table Variations in Orange Juice); (3) do not generalize about "orange juice," or assume there is a meeting of the minds on the part of any two individuals or group of individuals, when using the words "orange juice"; (4) words "orange juice" are not the thing "orange juice"—the product to be used.

I suggest that whoever has an interest in "orange juice" should adopt the attitude expressed in this article. This same "attitude" or "feeling" toward "symbols" "words" has contributed to advances in the fields of mathematics, physics, chemistry, engineering. It has made for marked progress in these fields. We should adopt it in the food business.

—End—

Equipment Standardization

(Continued from page 89)

national transportation system, and recommended to the manufacturers of this type equipment that they foster the sale of 7 and 11 in. lowered heights trucks. Lift-truck manufacturers, almost since the invention of this handling system, made the trucks in four lowered heights, namely, 6, 7, 9, and 11 in. This caused vast confusion due to loss of interchangeability. Due to the greater ease in hauling heavy loads over normal obstructions such as elevators, thresholds, differences in floor level between loading docks and freight cars and trucks, and floor cavities, qualified materials handling engineers encouraged the use of the largest model. Uninitiated salesmen and buyers, however, would still buy the other sizes indiscriminately.

As a result we have a hodge-podge of what would otherwise be a national or international handling system. It was unfortunate that the government, railways, shipping lines and large industries did not fully appreciate the advantages possible

did you know that you can get this Hardware

IN STAINLESS STEEL?

...and one call will do it all

CAMBRIDGE, MASS.
TROWBRIDGE 7000

INDUSTRIAL STEELS, INC....with America's largest warehouse stock of stainless shapes and parts...carries a complete line of the hardware and fittings shown above, in all sizes and types. Any of these standard parts can be shipped immediately on receipt of your order.

In addition to stainless hardware and fittings, INDUSTRIAL STEELS, INC. maintains complete stocks of stainless sheet, bars, tubes, wire, valves, and welding electrodes ...ready for prompt deliveries.

You pay no price premium for this convenient service. For anything in stainless steel, it will pay you to get in touch with INDUSTRIAL STEELS, INC. ...and let one call do it all.

For More Information, Write For This Catalog

JMLCo CI-M1

INDUSTRIAL STEELS, Inc.

250 Bent Street, Cambridge 41, Mass. • TROwbridge 7000 • Teletype: Cambridge 547

Paksure
FOOD PACKAGINGS
ATTRACTIVE, PROTECTIVE
PACKAGINGS...FOR ALL FOODS

We are designers and manufacturers of distinctive, *original* food packagings to your special order or available from stock. New packagings, including wrappings, bags and envelopes utilizing cardboard, plain or printed glassine, cellophane, laminated papers etc., will offer your products prestige and sales appeal.

We can package *anything* you make, including frozen foods . . . why not send us your packaging problems?

PACKAGING DIVISION
E. W. Twitchell Incorporated
777 Public Ledger Bldg.
Philadelphia 6, Pa.

YARWAY Spray Nozzles

INVOLUTE TYPE FOR CONE-SHAPED SPRAY

for WASHING • RINSING • COOLING • HUMIDIFYING

Get the most out of your Spraying Equipment without unnecessary power or liquid waste.

Use Yarway Nozzles. No internal vanes or other restrictions to clog or hinder flow. Two types —Yarway Involute type producing a fine cone-shaped spray with minimum energy loss, and Yarway Fan type producing a flat, fan-shaped spray with time-saving slicing action for cleaning.

Wide range of standard sizes and capacities. Cast or machined from solid bar stock.

Many thousands in use. Write for literature.

YARNALL-WARING CO., 127 Mermaid Ave.
Philadelphia 18, Pa.

FAN TYPE FOR FLAT SLICING SPRAY

and push for standardization, not of two models, but of one. If this had happened, today we would have a nationally integrated system of materials handling capable of saving billions of dollars. "It is never too late to mend"—and it is my earnest contention that the adoption of one size of lift-trucks by the entire industry as standard, in time would still bring the full benefits of this system into more universal use. This does not mean that other sizes would be abolished, but they would not receive the attention, in advertising or sales promotion, that the one standard size would receive. Going a step further in standardization, adopting a standard lift, such as 3 in.; a standard width, such as 24 in.; and fewer capacities, such as 3,000 lb. and 5,000 lb., would promote greater sales, lower costs, and avoid many inadequate installations due to lack of knowledge by the purchaser. After all, there is a certain factor of comfort in knowing that you are buying an article standardized by an industry, even when you just take your pick with only an inexperienced salesman at your elbow. Standardization of lift trucks partakes of the same fundamental considerations as determining the track gage of a national railroad system. Our railroad men in the beginning had foresight. The Europeans did not. As a result, we have a vast integrated railroad system but Europe has a definite problem. To give you a better idea of the necessity of standardizing lifts and capacities, two manufacturers offer the following choices: Lifts, 1⅝, 1¾, 1 13/16, 2, 2¼, 2½, and 3 in.; capacities, 1,000, 2,000, 2,500, 3,500, 5,000, and 6,000 lb.

Fortunately, the cost for differences in lifts should not be great, as it is usually not a function of labor or capacity. This is true, too, within certain ranges of capacity. Imagine the difficulty which results from insufficient lift and capacity because all these models are exploited for the benefit of a few.

It should be noted, too, that if the hand lift truck is standardized, so too will be the skid platform and also the electric or gas powered lift truck which serves it. The greater volume of these produced would again influence lower costs of product as well as distribution. American manufacturers have done phenomenal things in production, but distribution, of which material handling is a part, calls for even greater efforts. This is a real challenge when it is so often true that the cost of distributing an article is equal to the cost of production.

IN RESINS! Glycerine is an important component in the making of alkyd resins, used for automotive finishes and for finishes on refrigerators, stoves, and other home appliances, because it is efficient and high-boiling, and offers complete availability of all three of its hydroxyl groups. Pictured above is a depth gauge used to measure the thickness of paint.

What's News In Chemistry?

—Glycerine!

GLYCERINE, known for generations to chemists, is still something new, something exciting in its possibilities, both for products for human consumption and for use in industry.

Glycerine is chemically stable under ordinary conditions, and by proper choice of conditions many other useful chemicals can be made from it.

For instance, glycerine is an important component of alkyd resins, used in making protective coatings and in processing textiles. It is used in making ester gum, an important constituent of varnishes.

It is one of the basic materials used in making monoglycerides, employed in shortening and margarines. And it is used in making polyglycerols, which are higher-boiling, more viscous glycerine-like substances useful in the manufacture of some of the resins.

Because of its many advantages, so many manufacturers desire glycerine for so many purposes that this versatile material is more in demand than ever before.

GLYCERINE PRODUCERS' ASSOCIATION

295 Madison Avenue, New York 17, N. Y., Dept. G-15, Research Headquarters, Chicago, Ill.

IN DRUGS AND COSMETICS! Glycerine has been a known and trusted standby for generations in the making of pharmaceuticals. It is also a material that offers ever-new possibilities.

IN FOODS AND CONFECTIONS! U.S.P. glycerine, pure, sweet, and wholesome, is a valuable ingredient in itself—and also offers advantages in the derivatives that can be made from it.

IN TEXTILES! Glycerine is used in dye baths, printing pastes, and spray-dye solutions employed in coloring and printing many types of textiles. The use of glycerine-derived alkyd resins in the textile field is growing.

MAKING RECORDS

for

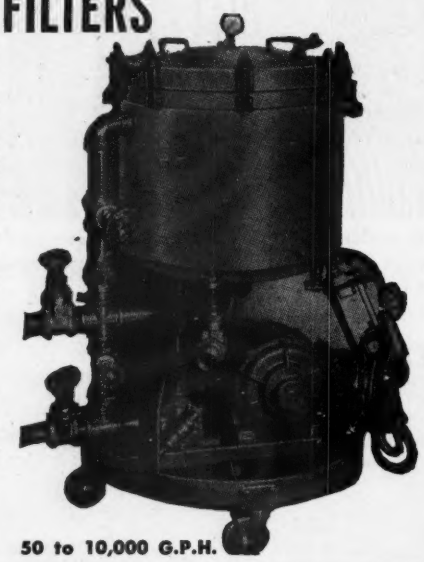
High Quality, Speedy, Uniform FILTRATION of food liquids

SPARKLER HORIZONTAL PLATE **FILTERS**

Under the Sparkler process you obtain maximum clarity and purity in your food products for mimimum outlay. All the material to be filtered is cleared and no unfiltered residue ever remains. Filters are comprised of nested perforated plates. No messy screens to clog up, clean or replace. Positive clamping action prevents leakage.

Sparkler units are highly adaptable, have longer filtering cycles, are sturdily built, economical to own and operate. Plates are interchangeable and easy to clean.

Present your filtering problem to us and we will offer a solution—no obligation.



50 to 10,000 G.P.H.

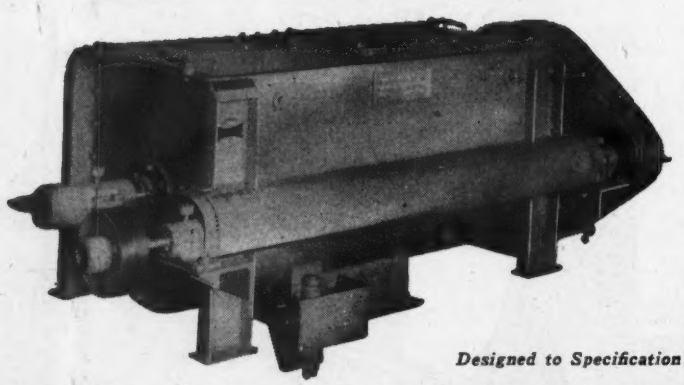
SPARKLER MFG. COMPANY

276 Lake Street MUNDELEIN, ILL.

ROBINSON

PROCESSING UNIQUE **EQUIPMENT**

HORIZONTAL MIXERS



Designed to Specification!

Capacities from 1 to 234 cu. ft. per charge. Agitators built to relieve end load on bearings. Center inlet and discharge gates. Covers flush or sealed. Outboard roller bearings. Packing glands on mixer body. Robinson Processing Equipment designed by experienced engineers. Literature available. Inquiries invited.

ROBINSON MANUFACTURING CO.

Plant: Muncy, Pa.

SALES REPRESENTATIVE

MERCER-ROBINSON COMPANY, INC.

30 CHURCH ST., NEW YORK 7, N. Y.

It should be remembered that voluntary standardization is a democratic method and part of our American way of life. If we are to continue to prove that our way is the best, we must be prepared to do things like this. If we agree that this idea of fostering a national system of materials handling through standardization is good, yet do nothing about it, we must not be surprised if other countries, with less democratic methods, order such things by law and then outdo us later in their efficiency.

It seems to me that the future of any industry is not to see how many different types of models they can turn out, but rather to see how few, and, by the same token, to find and discover more uses for these products.

The materials handling industry has come of age and is, therefore, entitled to bend its every effort through standardization for handling the "Logistics" of peace.

—End—

Clean Flavor

(*Continued from page 100*)

frigerators are at times allowed to go too long without washing and without taking up the grating on the floor to give the floor and grating a thoroughly efficient cleaning. Too frequently, bowls of leftover pie fillings, icings, and batters are placed in the refrigerator, uncovered. Because the refrigerator is, of necessity, a highly confined space with practically no ventilation, one food will pick up an odor from another food. To verify this, carry on this simple test. Leave a bowl of a bland-flavored cream icing or marshmallow in the refrigerator uncovered for about a week. Then, carefully remove the top layer, down to about one-eighth or one-quarter of an inch. Put up a small sample of this surface icing. Put up another sample of the same icing, dipping down in the bowl. Take the two samples away from the plant, and after allowing your sense of smell to return to normal, compare the two in odor and flavor. The results will show that the sample taken from the top may have a distinctive off-flavor. Now what happens when these leftovers of icing are taken out of the refrigerator and used in the plant? The operator usually stirs it up until the slight crust which has formed is distributed through the icing, mixing the contaminated surface with its off-flavor into it. This contamination will still be in the icing when the consumer eats the

Bronze Valves with a Pedigree

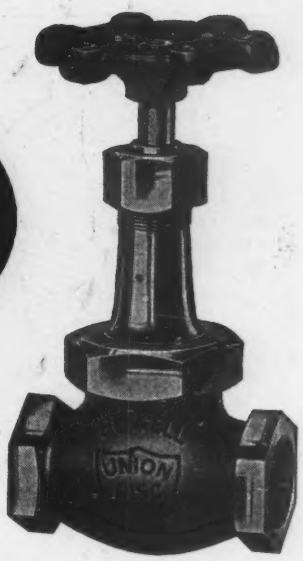


Fig. 150

The Powell Line of Bronze Valves for intermediate steam, water and gas lines is not an overnight development. Rather, it is a result of evolution through Powell's 100 years of practical, scientific progress in the art of valve-making. In short, they are "Valves with a Pedigree".

The same is true of all Powell Valves for the Food Processing Industries, including Iron and Steel Valves of all necessary types and pressures and, to avoid contamination in the end products, a complete line of valves of all types, including Flush Bottom Tank, in every material (pure metal or special alloy) necessary to resist corrosion in process lines.

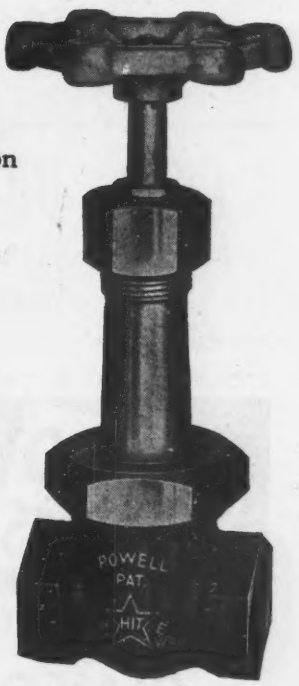


Fig. 375

See our Exhibit at Booth 54
20th Exposition of Chemical Industries
Grand Central Palace, New York
February 25 to March 2, 1946

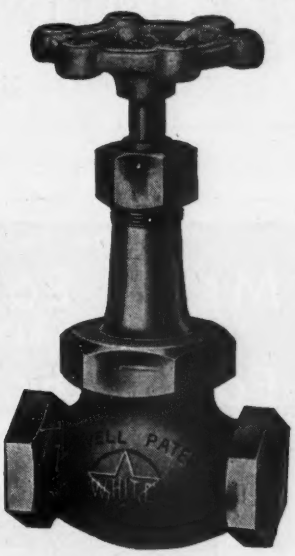


Fig. 1708

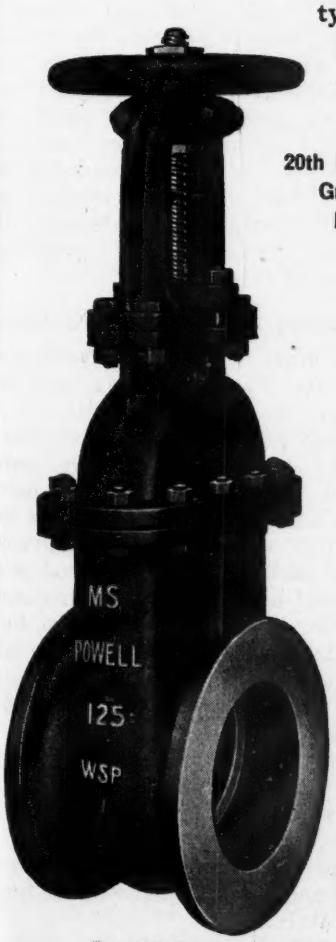


Fig. 1414

Fig. 500

Fig. 1414—125-pound Bronze O. S. & Y. Gate Valve with flanged ends.

Fig. 500—125-pound Bronze Gate Valve with screwed ends, inside screw rising stem and screwed bonnet.

Fig. 1708—200-pound Bronze Globe Valve with screwed ends, inside screw rising stem, union bonnet, renewable seat and regrindable, renewable wear resisting semi-cone plug type disc.

Fig. 375—200-pound Bronze Gate Valve with screwed ends, inside screw rising stem, union bonnet and renewable wear resisting seat rings and disc.

Fig. 150—150-pound Bronze Globe Valve with screwed ends, union bonnet and renewable composition disc.

The Wm. Powell Co., Cincinnati 22, Ohio
DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

USE

Spiceolates

FOR BETTER SPICE FLAVORS

CALL D & O WITHOUT DELAY!

D&O Dodge & Olcott, INC.

180 VARICK STREET, NEW YORK, N. Y.

BOSTON • CHICAGO • PHILADELPHIA • ST. LOUIS • LOS ANGELES

Plants and Labs., Bayonne, N. J.

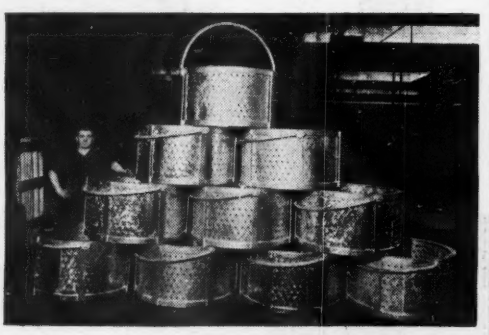
GLASCO TRADE MARK PRODUCTS

CUSTOM-FABRICATED METAL EQUIPMENT FOR BETTER FOOD PROCESSING

INDUSTRIAL CUSTOM-FABRICATORS FOR 35 YEARS

GLASCO METAL BASKETS for STERILIZING

We have FABRICATED-TO-ORDER thousands of these Baskets, as well as other types of batch-handling equipment for food processing . . . of perforated or expanded metal . . . Trays, Bins, Tanks, Containers, Trucks, Buckets, etc., from drawings or specifications to meet your most exacting requirements—all sanitary, corrosion-resistant, sturdy, and good looking. Our experience well qualifies us to render you expert service—don't hesitate to talk over your problems with us.



GLASCO EQUIPMENT IS FABRICATED IN ALL METALS

Our plant and facilities are complete for the fabrication of equipment from the following metals; aluminum, copper and brass, galvanized steel, lead and zinc, Monel Metal, stainless steel, stainless-clad, steel and iron, structural steels and tin.

GUSTAV GLASER CO., INC. AND ITS SALES SUBSIDIARY GLASCO EQUIPMENT CORP.

HOME OFFICE & PLANT, TWO WAIT ST., PATERSON, N. J.

NEW YORK CITY OFFICE, 501 FIFTH AVE.

cake. Moreover, the consumer's ability to detect off-odors will be keen because she has not been exposed to the air in your refrigerator.

Rancid Pan Grease

Another source of flavor contamination bears mention. Pans that are not washed frequently are a potential source of trouble. I recently investigated the problem of rancid cookies in a small retail bakery. These cookies possessed a very attractive flavor when freshly baked, but when stored in a cooky jar in the home, they soon developed the typical evidences of oxidative rancidity. When this off-odor made its appearance, it was determined that the pans were at fault. Cookies were sliced horizontally and the upper half of the cooky still possessed an attractive, fresh flavor. The bottom of the cooky, however, was distinctly rancid. In this case, the baker was using well-broken-in cooky pans. He hesitated to wash them too frequently because he was afraid the cookies would stick. The pan grease was definitely rancid on these pans, and because a small amount of rancid fat will cause fresh fat to go rancid in a much shorter time, he was shortening the shelf life of his cookies and receiving complaints. Adequate pan washing and greasing procedure eliminated this.

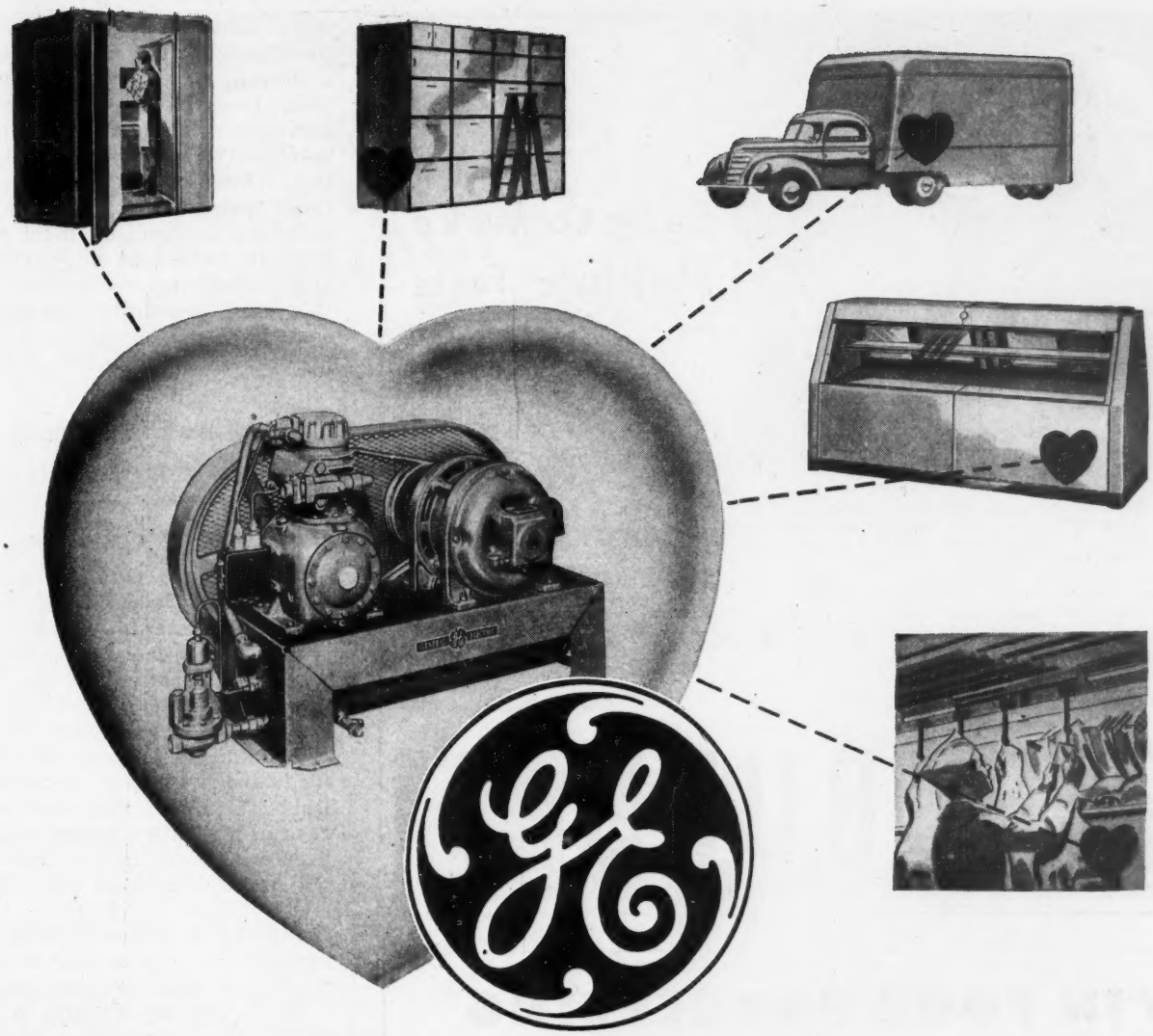
Packaging Material Absorb Odors

One final word about packaging materials. Paper products, and particularly waxed paper, will pick up off-odors and later impart them to food products. Furthermore, paper cartons will absorb fat from baked goods and not infrequently we find rancidity developing in a grease-soaked package before the food product itself has started to turn rancid. The odor of the rancid package, however, is quickly absorbed by the food product. The use of grease-proof liners will help eliminate this difficulty.

In setting up your postwar plans, may I impress upon you one principle which, if borne in mind at all times, will help you on the road to success in competing with sweet goods and desserts made in the home. Here it is:

"I will always remember that the products I make are food products—made to be *eaten* and *enjoyed* by my customers."

Handle all raw materials as a food product and *not as a commodity!* See that every operation in your plant is performed with this thought uppermost in mind. Walk through the plant and watch your operators at



The vital spot in your Refrigeration System

EFFICIENT, economical refrigeration . . . safety of perishables . . . trouble-free operation . . . they all depend upon the condensing unit . . . heart of your refrigerating system.

That's why it pays to take advantage of the service your G-E distributor has to offer. He will check your present unit for hidden waste. He will analyze your need for new equipment in relation to your future needs. He will help you keep your present unit (no matter what its make may be) going until a compact, modern G-E unit is available.

Remember, the G-E Condensing Unit is factory-tested and field-tested for a long life of service. It will do a vastly more efficient job than old-fashioned systems . . . and use only a fraction of the floor space previously needed.

Ask your nearest G-E distributor, today, to call and analyze your refrigeration needs. You'll find him listed under "Refrigeration" in your Classified Telephone Directory.

General Electric Company, Air Conditioning Department, Section 9892, Bloomfield, New Jersey.

GENERAL ELECTRIC

Easy to make Moisture Tests with a

Steinlite

No special education or training is necessary to test for moisture in dehydrated foods . . . dried eggs, nuts, cocoa, etc. About all one does is (1) weigh out a sample, (2) pour it into the Steinlite hopper, (3) read a meter dial, and (4) compare the reading with a chart showing percentage of moisture.

The Steinlite is ACCURATE . . . calibrated against official oven methods. Built by a pioneer organization of radio engineers. When used by an experienced operator it is "the one minute moisture tester." More in use than all other electric moisture testers combined. Many new uses being found. If you have a moisture testing problem, let us help you solve it. The Steinlite is sold on a FREE TRIAL basis. $325.00 F.O.B. Atchison, Kansas. Write for catalog number 146.

634 BROOKS BUILDING CHICAGO 6, ILLINOIS

SEEDBURO EQUIPMENT COMPANY

• IN FOOD PROCESSING

When You Use Low Temperature

USE CORK

The time to make sure of your insulation protection is before you build or expand. Get the facts on Cork insulation when they can do the most good. Cork is so efficient in insulating properties that its performance has long been the accepted standard for low temperature requirements. Its wide usage in the refrigeration industry is due to its proved record for more than 40 years. Mundet refrigeration engineers are experienced in all details of temperature control. Write to us now for recommendations and estimates . . . let us help you secure the most profitable use of low temperature. Mundet Cork Corporation, Insulation Division, 65 South 11th Street, Brooklyn 11, New York.

MUNDET CORK INSULATION

work. Give a thought to the storage conditions existing in the plant. Give a thought to an adequate supply of clean, fresh air throughout every department of the plant. On these inspection trips, ask yourself the question, "Are these conditions and are these operations consistent with the idea that my products must give joy and satisfaction to my customers?" If you cannot answer this frank question with a definite affirmative, do something about it.

—End—

Control by Fumigation

(Continued from page 86)

Further Applications

Although this work has dealt mainly with the prevention of microbiological spoilage in packaged dried fruits of high-moisture content, the possible applications of the fumigation technic as a method of food preservation are innumerable.

Certain preliminary experiments conducted with the cooperation of Dr. N. N. Hansen indicate that treatment of figs with ethylene oxide after harvesting and before sun drying will reduce dry yard spoilage materially. Since the fruit is normally fumigated at that time with methyl bromide, a combination of the two substances may be promising.

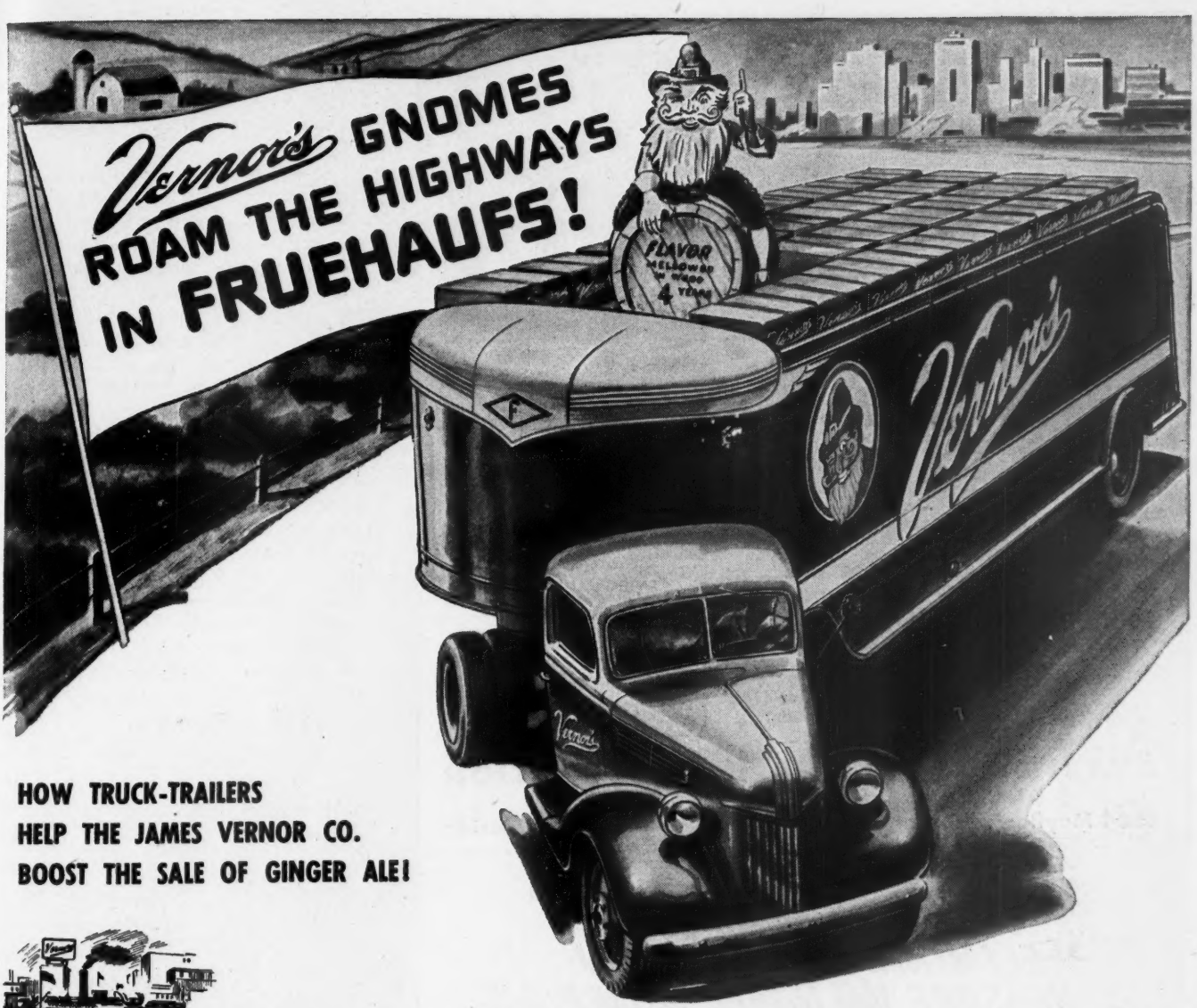
Where ethylene oxide is to be used for chamber fumigation, it is probably best not to mix it with any substance to lower vapor pressure, but it must be remembered that the material is explosive. The concentration required for chamber fumigation falls in the explosive range, and adequate precautions must be taken to ensure safety. A reduction of the explosiveness by mixing with CO_2 has been discussed before.

It was found possible to prevent microbiological spoilage of high-moisture fruit dessert rations for Army use by application of the fumigant. Further studies no doubt will reveal added possibilities for its use on other foods and food products quite unrelated to dried fruits.

Summary

The use of ethylene oxide and propylene oxide as a method of controlling microbiological spoilage of unsulphured fruits of high moisture content was investigated. It was found that ethylene oxide, which is able to kill microorganisms under a variety of conditions, can be used successfully for this purpose on dried fruits. Propylene oxide also shows promise in this respect.

To simplify commercial applica-



HOW TRUCK-TRAILERS HELP THE JAMES VERNOR CO. BOOST THE SALE OF GINGER ALE!

IF YOU'VE ever boarded a Great Lakes passenger boat at Detroit, likely as not you've seen the big Vernor Ginger Ale sign from the pier.

Or perhaps, while traveling the highways of the central states, the winking gnomes — the company's trademark — on the sides of their Trailers may have caught your eye. For throughout Michigan and adjoining states, this beverage rides the highways in Fruehaufs.

Vernor's, now America's largest selling beverage ginger ale, was introduced to Detroiters shortly after the Civil War. It's popularity rapidly increased. With rising demands came greater delivery problems—and during the past decade Fruehauf Trailers have played an important part in serving this expanding market.

By coupling their trucks to Trailers and pulling their loads, double the number of cases are carried — because a truck can pull far more than it is designed to carry. Fewer trucks are needed to keep branches well stocked. Manpower is saved. Operating cost is held to a minimum — and, Vernors will tell you from their own experience that one Fruehauf outlives several trucks.

Thus, this flexible hauling method is an important factor in maintaining the uniform retail price of the beverage.

It is more than likely that Fruehauf Trailers can help you expand your sales territory as they have assisted in more than 100 different lines of business. A call to the nearest Fruehauf Branch will bring you the complete Trailer story.

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER CO. • DETROIT 32

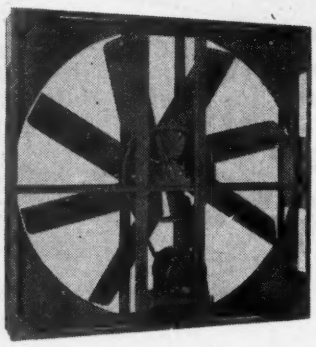
Service in Principal Cities

Fruehauf TRAILERS
"ENGINEERED TRANSPORTATION"
REG. U.S. PAT. OFF.
A TRUCK IS LIKE A HORSE
IT CAN PULL MORE THAN IT CAN CARRY
Motor Transport
WILL GET YOUR JOB DONE
If you aren't using truck transportation, have you ever challenged your shipping costs and over-all efficiency with the job that professional haulers can do for you?

PLAN NOW . . . FOR PROFITS IN 1946

WITH Coolair TRADE MARK

EXHAUST FANS



Federal Tax Relief promises new opportunities to business men for reasonable profit-making in 1946.

Workers . . . happy, willing workers . . . will be necessary—and scarce. You can compete far more effectively for the kind of workers you need by breeze-conditioning your workrooms and offices for helpful, pleasant coolness with one or more Coolair exhaust fans.

Right now, many sizes of Coolair fans are in dealers' stocks or can be shipped quite promptly from the factory.

Next Spring, the story will be different, for Coolair dealers everywhere are planning installations and booking orders for their customers on a "first come, first served" basis that promised to absorb our increased production.

ACT NOW! Call in your Coolair dealer or agent, or write us for information.

CATALOG PAGES
Fan models, dimensions and performance data can be found in
SWEET'S
ASHVE GUIDE and
ELECTRICAL
BUYER'S
REFERENCE

AMERICAN COOLAIR CORPORATION

"Pioneer Manufacturers of V-Belt Drive Exhaust Fans"

3604 Mayflower Street Jacksonville 3, Florida

COSTLY HUMAN ERRORS ELIMINATED WHEN YOU MEASURE VALUABLE STORED LIQUIDS With

LIQUIDOMETER Tank Gauges

FOR GAUGING LIQUIDS OF ALL KINDS
100% AUTOMATIC
APPROVED BY UNDERWRITERS' LABORATORIES

WRITE FOR COMPLETE DETAILS

"LIQUIDS WORTH STORING ARE WORTH MEASURING"

THE LIQUIDOMETER CORP.
38-14 SKILLMAN AVE., LONG ISLAND CITY, L.I., N.Y.

tion, ethylene oxide, which is a gas at ordinary temperatures, is mixed with isopropyl formate, the mixture having a boiling point high enough so that it is a liquid at ordinary temperatures.

Using this mixture in large scale experimental runs in commercial plants, it was found possible to package figs at a moisture content of 30 percent for an indefinite period of time without molding or fermentation, providing no recontamination of the fruit took place after fumigation. Packaging figs at a moisture content above 26 percent prevents sugaring during storage.

The nature of the residues left by such fumigants and their possible toxicities was discussed. In addition, there were suggested further applications which may be found for the use of fumigants in general to prevent microbiological spoilage.

Acknowledgment—The authors express their thanks to Paul Richert for his many helpful suggestions, and to Karen Fuller and Ruth Allemann for technical assistance.

References

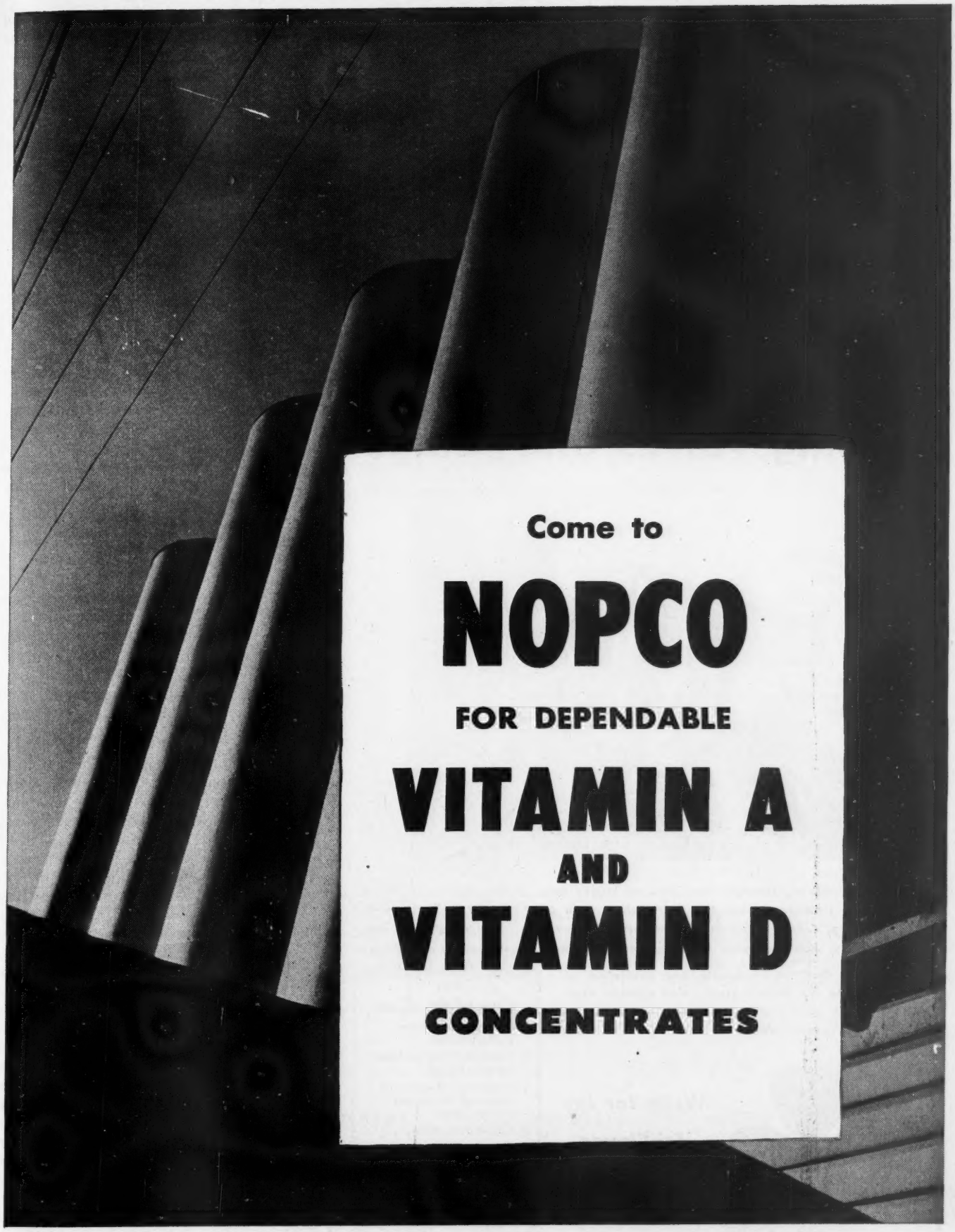
16. H. J. Phaff, R. Whelton and E. M. Mrak, Microbiological Studies of Prune Dehydration. (In press.)
17. F. K. Baerwold, U. S. Patent No. 2,370,768. (Applied Oct. 2, 1944; patented March 6, 1945).
17a. C. D. Fisher. Controlling Storage Insects by Fumigation. Food Ind., vol. 17, 1178, 1945.
18. F. Zernik, *Uber Aethylenoxyd, Die Gasmaske,* vol. 5, 3, 1933.
19. C. P. Waite, F. A. Patty and W. P. Yant, Acute Response of Guinea Pigs to Vapors of Some New Commercial Organic Compounds—IV. Ethylene Oxide, U. S. Public Health Reports, vol. 45, 1832, 1930.
20. T. Sudendorf and E. Kroger, Ethylene Oxide in Combating Deterioration in Foods, *Chemiker-Zeitung,* vol. 55, 549-50, 570-72, 1931.
21. E. P. Lang, H. O. Calvery, H. J. Morris and G. Woodard, The Toxicology of Some Glycols and Derivatives, *Journal of Industrial Hygiene and Toxicology,* vol. 21, 173, 1939.
22. H. J. Morris, A. A. Nelson and H. O. Calvery, Observations on the Chronic Toxicities of Propylene Glycol, Ethylene Glycol, Ethylene Glycol Monoethyl Ether, Acid Diethylene Glycol Monoethyl Ether, *Journal of Pharmacy and Experimental Therapeutics,* vol. 74, 266, 1942.

—End—

Aqua Destillata

(Continued from page 92)

condenser flanges. This facilitates both disassembling and reassembling. Examination of the baffle may reveal some scale on the bottom plate facing the evaporator. This can be removed with dilute hydrochloric acid. There should be no scale on the vapor side of the condenser. Scale here indicates improper operation, and its removal if frequent will eventually necessitate retinning of the condenser. The cooling water tubes in the condenser and cooler should be examined for scale when the heads



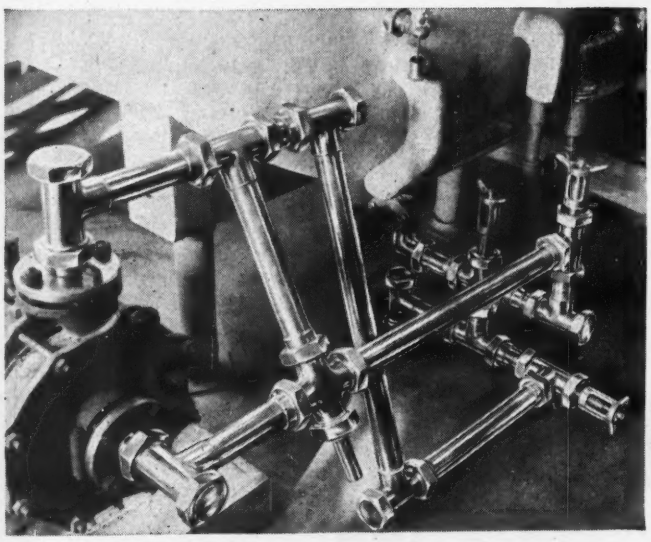
NATIONAL OIL PRODUCTS COMPANY

Boston • Cedartown, Ga. • HARRISON, N. J. • Chicago • Richmond, Calif.

Pioneer producers of *natural* Vitamin A and Vitamin D Concentrates, Rice Bran Concentrate and Calcium Pantothenate

BLUE RIBBON HERDS

cannot deliver pure milk through ordinary fittings, tubing, valves, and pumps



Farm herd milking facilities and pick-up trucks may be the last word in efficiency and cleanliness—but the dairy plant with all TRI-CLOVER Sanitary Fittings, Tubing, Valves and Pumps has complete assurance that the milk will reach pasteurizers, homogenizers and separators without bacterial contamination.

TRI-CLOVER Sanitary Products are available at any place in the United States and eastern Canada through well-known dairy supply houses of the highest responsibility.

THE *Complete Line*

1. Trialloy (Cupro Nickel) Sanitary Fittings
2. Fabricated Stainless Steel Sanitary Fittings
3. Pumps (Centrifugal—non-agitating) Trialloy and Stainless Steel
4. Custom Fabrication
5. Sediment Testers
6. Line Filters

Standardized Accuracy and Interchangeability are YOUR Tri-Clover Guarantee.

TRI-CLOVER

Write for the Tri-Clover Catalog.

SANITARY FITTINGS VALVES *and* PUMPS

TRI-CLOVER MACHINE CO.
2815 60th Street
KENOSHA, WISCONSIN

are removed. They can be brushed out if necessary. Scale here will reduce the output of the equipment.

Testing for Leaks

Ordinarily, the less the condensers and coolers are disturbed, the better. Whenever removed, they are pressure tested under water for leaks, then flushed out with distilled water and reinstalled as soon as possible. Rigid but strain-free support is essential. Vibration or inadequate support may result in opened seams or loose tubes. Leaks so originating are frequently hard to find as the joints may tighten up when the equipment is cold. Tightness of the condenser can in general be established by filling up the vapor side with distillate.

Regardless of mechanical inspection and pressure testing, it is essential to maintain constant distillate control testing. After re-assembly of a still a 12-hour boiling out period is allowed—essentially normal operation without collection of distillate—following which the distillate is collected and tested. A new still may require boiling out for a week or longer before the distillate passes test. It is preferable to use new gaskets whenever the gaskets are disturbed, and spare sets should accordingly be kept on hand. If re-used, the tin covering may crack, thus exposing the gasket material and creating a pocket for contamination.

Steam Consumption

Anyone contemplating a distilling installation will need to take account of steam requirements. In good condition and correctly operated, these stills should operate at from 75 to 85 percent efficiency. Loss of efficiency may be caused by moisture present in the heating steam, excess cooling water, excessive bleed, or operation below capacity. In three specific tests on a recently cleaned still, efficiencies of 73, 74 and 77 percent were obtained when the still was operated at two-thirds of capacity. The efficiency factor was obtained by dividing the weight of distillate from the cooler by the weight of condensate from the heating coil. This result is regarded as fully satisfactory operation. A 75-gal.-an-hour still will require up to 25 boiler-horsepower. Operating cost depends on the cost of steam. A round figure of $1 per 1,000 lb. may be used as an average price for steam. This works out to an average cost of approximately one cent per gal. of distillate. Other charges include depreciation, general overhead, supervision, repairs and maintenance, all of which are variable. The battery described has been kept in full operation for from 8 to

Wickwire belts heed the warning

GLASS
HANDLE WITH CARE

Made of Wisscoloy 12 analysis wire, 36-41-14 balanced spiral weave construction; this Wickwire Spencer lehr belt is one of a number of belts used by Metro Glass Bottle Co. of Jersey City, N. J. Belts are from 164 to 250 ft. long; operate at temperatures ranging from 950°F. to 1200°F.

In scores of industries Wickwire Spencer Metal Conveyor Belts are speeding production, reducing handling costs and insuring more uniform quality.

In the glass industry, for example, they handle anything from ½ oz. prescription bottles to street lighting globes 28" high, 15 7/16" dia., weighing 17 lbs. apiece. Even tall, small-diameter olive bottles are carried through annealing lehrs without danger of tipping, strain or bottom cracking.

Wickwire Spencer Metal Conveyor Belts are the accepted standard for processing of foods, in heat treatment of metals and handling of numerous other materials.

Custom-engineered to operate at temperatures as low as −40° F. or as high as 2100° F., Wickwire Belts are built of any metal or alloy capable of being drawn into wire, to resist chemical corrosion, abrasion and other grueling punishment.

If you have a conveyor belt problem our engineers will be happy to cooperate in its solution. Send for our illustrated catalog showing types and advantages of numerous conveyor belt constructions. Address Mechanical Specialties Division, Wickwire Spencer Steel, Sterling St., Clinton, Mass.

WICKWIRE SPENCER METAL CONVEYOR BELTS ARE BEING USED IN

Annealing Ovens	Chemical Processing	Canning	Frozen Foods
Baking Ovens	Decorating Glass	Dehydrating Food	Hardening Furnaces
Brazing Furnaces	Ceramic Products	Degreasing	Infra-Red Drying

WICKWIRE SPENCER WS Steel

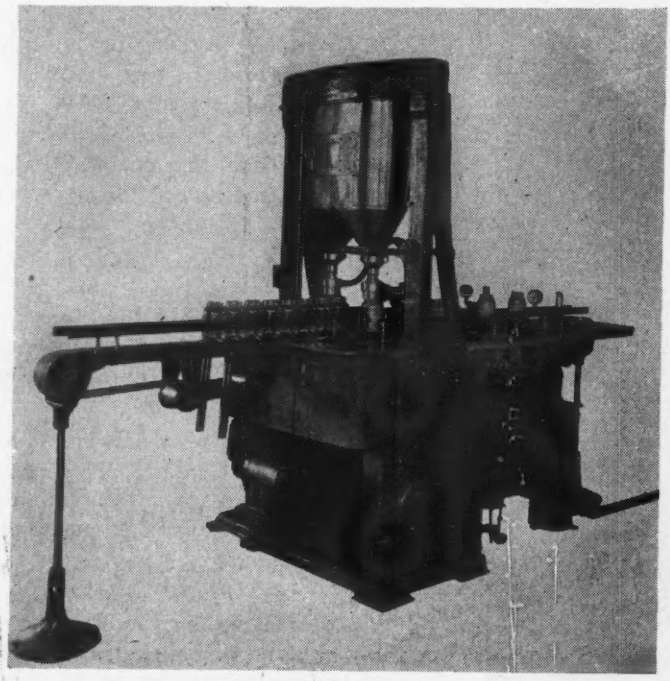
A DIVISION OF THE COLORADO FUEL AND IRON CORPORATION
EXECUTIVE OFFICES—500 FIFTH AVENUE, NEW YORK 18, N. Y.
Abilene (Tex.) • Boston • Buffalo • Chattanooga • Chicago • Clinton (Mass.)
Detroit • Houston • Los Angeles • Philadelphia • San Francisco • Tulsa • Worcester

FILL POWDERS INTO JARS THE "AUGER-VAC" WAY

Clean . . . Fast . . . Accurate

In the S & S Automatic Filling Machine with Auger-Vac equipment, packers of powdered milk, ice cream mix, malted milk, cocoa and many other products, have the answer to their packing problems.

"Auger-Vac" is a combination auger-vacuum system. The speed and accuracy of the auger feed, plus the dustless fill of the vacuum method, fills jars, cans or other air tight containers with the desired amount of packing and insures a dustless fill and tight pack.



Shown here is the HG-84 Duplex Heavy Duty Filling Machine equipped with Auger-Vac; production 50 per minute. Various types of this machine are available with "speeds to suit your needs"; 15-25-50-100 per minute. The Auger-Vac method may be used also on S & S Single Unit Filling Machines.

The rush of orders in recent months has taxed our manufacturing facilities. We are doing everything possible to meet the demand for machines . . . it will pay you to wait a little longer for an S & S unit—the right machine for the job.

Engineering consultation at your disposal—write for full information.

STOKES & SMITH Co

4911 Summerdale Ave., Philadelphia 24, U. S. A.

FILLING • PACKAGING • WRAPPING MACHINES

"Better machines for better packages"

12 hr. per day, 6 days a week, for a period of 5 years, and is in as good as new condition.

Alloy Construction

Experience with this three-still battery suggests only one possible major improvement. Although tinned copper has been the accepted material for construction for many years, it may be possible to utilize alloys, better suited for chemical cleaning, for the evaporator. Use of one of the types of Hastelloy, resistant to hot hydrochloric acid, would simplify descaling and eliminate hand brushing. Stainless steel or stainless clad could be considered for other parts of the still, but would entail a cost increase of two to three times.

—End—

Damage by Freezing

(*Continued from page* 105)

cold. There also was some drying out of the ham component. The damage to these commodities was the only severe damage observed which approximated that previously observed in the first part of the study carried out at –30 deg. F.

The physical condition of the cans containing the products used in this experiment was also observed. At the end of the experiment the cans were examined for physical condition by the committee which determined the comparative acceptability of the products. Although moisture collected on the surface of the cans when they were transferred to room temperature, none were rusted. The seams of the cans were not ruptured or distorted.

Results of this study give evidence that canned meat products which do not contain an appreciable amount of starchy components can be frozen with no deleterious effect. On the basis of this evidence one can conclude that protection against freezing is not necessary during shipment or while these products are in storage. On the other hand, canned meat products which do contain components with a high carbohydrate content will not withstand freezing and should be afforded adequate protection when stored. Also, if their maximum acceptability is to be retained, insulated freight cars or cars with heaters should be used when shipments are made under freezing conditions during the winter months. Throughout this study the cans containing the canned meat products were not damaged by freezing nor by alternate exposure to cold and room temperatures.